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## XIV.

## CONTRIBUTIONS TO AMERICAN BOTANY.

BY SERENO WATSON.

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1. *A History and Revision of the Roses of North America.*

*History.* — Perhaps the earliest notice of our wild roses is found in the account of Gosnold's voyage in 1602, where the "eglantine" is noted among other plants growing on Cuttyhunk. Higginson (1630) and Josselyn (1672) also make mention of wild "single damaske roses" in New England, "verie sweete." The first botanist to mention an American species is Parkinson, in his *Theatrum Botanicum*, in 1640, where he describes his "*Rosa sylvestris Virginiensis*; the Virginia Bryer Rose," with "divers as great stemmes and branches as any other Rose, set with many small prickles and a few great thornes among them, the leaves very greene and shining, small and almost round." He does not state upon what materials his description was based, but, as it accords rather more nearly with *R. lucida* than with any other species, they were probably from New England, which was included in the region then known as Virginia. The name and essentially the same description are given by Ray in the *Historia Plantarum* (1693), but without any additional information.

The next description is by Dillenius, in the *Hortus Elthamensis* (1732), of a species introduced into England by James Sherard in 1726, which he figures and describes under the phrase "*Rosa Carolina fragrans*; *foliis mediotenus serratis*." From the name it may be inferred that it was originally from the Southern States, and it may be quite clearly identified with the *R. humilis* of Marshall (the later *R. parvifolia* of Ehrhart). He also describes and figures a second species as raised by Sherard from seeds received from New England. This, however, is evidently not an American rose, but European, as was perceived by Linnaeus, who made it the basis of his *R. pendulina*. Too much confidence in Dillenius's statement of its origin led later botanists into much needless trouble in attempting upon no other ground to retain it among American species.

In 1736 Clayton sent two roses to Gronovius from Virginia, one as a Dog Rose, "*Rosa canina*," the other as a "Sweet Bryar," which were published by Gronovius in 1739 in the *Flora Virginica* under Clayton's exceedingly brief descriptive phrases. Linnæus, whose good judgment led him to be very prudent in recognizing species in this genus, in the first edition of his *Species Plantarum* (1753) makes no reference to these species of Gronovius, nor to any but those of Dillenius, and solely upon the figure and description of the "*Rosa Carolina fragrans*" of the latter made his original *Rosa Carolina*. In the *Systema Naturæ* of 1760, however, and still more fully in the second edition of the *Species Plantarum* (1762), he redescribed the species from specimens raised in the Upsal Garden; but, noticing the discrepancies, he now cited Dillenius with a doubt. The specimens preserved in the Linnæan herbarium satisfactorily identify this first established species, as Linnæus here and always afterward defined it, with the *R. Carolina* as it was figured by Wangenheim (in 1787) and others, and as it has long been generally understood in this country.

Miller, who was the authority of his day upon the cultivated plants of England, in the seventh edition of his *Gardeners' Dictionary* (1759) described the "Wild Virginia Rose, kept in gardens for the sake of variety, and growing naturally in Virginia and other parts of North America," and, considering it the same as the *Rosa sylvestris Virginensis* of Parkinson and Ray, he adopted their specific phrase, and accordingly in the next edition (1768) named it after the Linnæan method *Rosa Virginiana*. It is impossible to identify it from the description. The name was afterward taken up by DuRoi (1771 and 1772), Wangenheim (1787), and by Gmelin (1796), and applied by them to a form of *R. Carolina*, or perhaps to the same garden form that was described by Ehrhart in 1789 under the name *R. lucida*, to which species it was referred in Martyn's edition of Miller's *Dictionary* in 1807.

Gronovius in the second edition of the *Flora Virginica* (1762) adds a third species from Virginia, Clayton's "*Rosa alta palustris*" (his previous species being "*sylvestres*" or Wood Roses), and refers all three to Linnæus's *R. canina*, as varieties. Dr. Gray found in 1839 in Clayton's herbarium, preserved at the British Museum, two specimens, one "our *Rosa parviflora*," and the other near to it. Clayton's tall swamp rose was probably *R. Carolina*.

In 1772 DuRoi described two roses, then in cultivation in German gardens, under the names *R. Virginiana* and *R. Carolina*. The first appears to have been the true *R. Carolina*, and the latter Ehrhart's

*R. parviflora*, and Willdenow so understood them twenty-four years later.

In 1785 we find the first determinations of American roses by an American botanist, in the *Arbustum Americanum* of Humphrey Marshall. He mentions and partially describes four species as found in Pennsylvania, *R. Carolinensis*, *R. palustris*, *R. humilis*, and *R. Pennsylvanica plena*. The first, or the "Wild Virginia Rose," is given in all probability simply to cover the ground already occupied, for the description, as evidently as the names, is taken wholly from Linnæus and Miller. The second species, the "Swamp Pennsylvania Rose," is the true *R. Carolina*, and his description is a better one than had before been made. The *R. humilis*, or "Dwarf Pennsylvania Rose," is without doubt what has usually been regarded as Ehrhart's *R. parviflora*, and his name has every right to recognition in preference to the latter. It is not easy to account for the double-flowered form of this, of which he makes his last species.

Wangenheim, who as a captain in the Hessian forces had been from 1777 to 1780 in this country, after his return to Germany published in 1781 a description of some North American trees and shrubs, and in 1787 a more elaborate account in his *Beytrag zur teutschen Forstwissenschaft*. In the first he describes only the *R. Carolina*, but in the latter, in addition to a good description and recognizable figure of that species, he gives descriptions of "*R. Virginiana*" and of "*R. Pennsylvanica flore pleno, mihi*," the first not recognizable, the other a myth as respects any wild native species.

Walter in his *Flora Caroliniana* (1788) mentions only *R. Carolina*, with varieties "calycibus laciniis brevibus integris; et longis, lacinia-tis." This is the earliest reference to the rose which Michaux afterwards described as *R. setigera*.

Aiton's *Hortus Kewensis* (1789) refers everything previously published to *R. Carolina*, under a half-dozen varieties. Here first appears *R. blanda*, with a good description, stated to be a native of Newfoundland (where it was collected by Sir Joseph Banks) and Hudson's Bay, cultivated since 1773 by James Gordon. In the same year Ehrhart published, in his *Beitrag zur Naturkunde*, three species then in cultivation in the gardens at Hannover; viz., *R. parviflora*, of which he knew only a form with double flowers, *R. corymbosa*, which he rightly considered the same as the Linnæan *R. Carolina*, and *R. lucida*. He gives *R. Carolina* of DuRoi as a synonym of *R. parviflora*, and appears to have had DuRoi's description in mind in drawing up his own. There was probably some connection between this double-flowered

species of Ehrhart and the double-flowered *R. Pennsylvanica* of Marshall and of Wangenheim. Its origin is of course uncertain, but it may have been the survival in European gardens of the *Rosa Carolina fragrans* of Dillenius, the single form having become rare through neglect. Willdenow knew it only as double; Lindley also, in 1820, had never seen it single; and the only cultivated specimen in the Gray herbarium, from Jard. Luxembourg (1814), is double. This specimen differs little otherwise from native specimens of the species for which I have adopted the earlier name of *R. humilis*. Ehrhart, however, described it as having the calyx-lobes entire, which is not the case in *R. humilis*. His *R. lucida*, as it was more fully described by Willdenow, who probably knew what Ehrhart meant, may be with some certainty identified with the common New England species with dark shining leaves, and the name may be accepted as the earliest, and as appropriate.

Willdenow in 1796, in his *Berlinische Baumzucht*, describes these three species (*R. parviflora*, *R. lucida*, and *R. Carolina*) more in detail, as again in his edition of the *Systema* in 1799, where he contrasts what he considers to be their distinctive characters, but overlooks the most important differences. In the latter work he adds Aiton's *R. blanda*.

Borkhauser in 1790, in an account of the shrubs of Hesse-Darmstadt, described a *Rosa fraxinifolia*, which Gmelin, in his *Flora Badensis* (1806), says was then common in cultivation and suspects to be the same as Aiton's *R. blanda*. There is no reason for doubting their identity.

Salisbury took occasion in his *Prodromus* (1796) to substitute arbitrarily the name *R. fragrans* for the Linnæan *R. Carolina*.

The next decided advance was made by Michaux, who in 1803, in the *Flora Boreali-Americana*, published his *R. setigera* and *R. lævigata*,—the latter an introduced species that had been in cultivation in Georgia for over twenty years. His other species, *R. Caroliniana* and *R. Pennsylvanica*, are shown by his herbarium to be, the first *R. humilis*, and the second a mixture of *R. Carolina* and *R. blanda*. Willdenow in his *Enumeratio* (1809) added *R. nitida* and *R. gemella*. The first is a well-marked species that had been found by Sir Joseph Banks in Newfoundland, and had become introduced into England and upon the Continent, though Willdenow was ignorant of its origin. *R. gemella* was also a cultivated species, described as having curved infra-axillary spines, and as intermediate between *R. lucida* and *R. Carolina*, but the leaves not at all shining. This is referable, with

little doubt, to *R. Carolina*, and the specimens in Willdenow's herbarium, as found by Crepin, confirm this view, at least in part.

In the second edition of the *Hortus Kewensis* (1811), by the younger Aiton, the only change made from the first is in the addition of *R. rubifolia* (usually credited to Robert Brown, though not included in his *Works*), based upon a pubescent form of *R. setigera* that had been introduced into the gardens of England.

In 1814 Pursh published the *Flora Americæ Septentrionalis*, in which he adopts all the species (and descriptions) of Willdenow's *Systema* and *Enumeratio*, adding Michaux's *R. setigera* and Aiton's *R. rubifolia*, as also two new species, *R. Lyonii*, which is a western form apparently of *R. humilis*, and *R. suaveolens*, which is the introduced Eglantine (*R. rubiginosa*). With Aiton and Willdenow, he retains the Linnæan *R. pendulina* as American, though he states that he had never seen it indigenous. He is evidently at fault in his understanding of several of the species, his *R. nitida* and *R. gemella* being both probably *R. humilis*, and his description of *R. blanda* is so modified in the appendix as to show that *R. nitida* is meant. He also describes an introduced garden species as *R. lutescens*.

Dr. Bigelow in his *Plants of Boston* (1814) recognized but a single native species (*R. Carolina*) in the region about Boston, and in the later editions of 1824 and 1840 expressed the same opinion. He may well have been encouraged in this belief by his experience (as narrated by Amos Eaton) in sending "three specimens to the greatest botanist in Europe [Sir J. E. Smith], which were all taken from different parts of the same plant. He received an answer, making two of the specimens different described species, and the third one a new species."

In the same year Rafinesque published in the *Précis des Découvertes* two new species, *R. flexuosa* and *R. enneaphylla*. The last may be referred with sufficient confidence to *R. Carolina*, while the first is evidently the introduced *R. canina*. As the name *R. flexuosa* was preoccupied, Trattinnick afterwards proposed for this the name *R. Rafinesquejana*. In 1816 Poiret published, with descriptions, in the supplement to Lamarck's *Dictionnaire de Botanique*, two species whose names Bosc had previously proposed in the catalogues of the Paris Garden, and which were supposed to be of American origin. The *R. rubrispina* is identified with *R. nitida*. The *R. Evratina*, however, as afterward figured by Redouté, appears to be a European species. His *R. rapa*, on the other hand, which is credited by Poiret to Scotland, has been supposed to be a double-flowered form of *R. lucida*.

Donn also, at about the same time, in his Catalogue of the Cambridge Garden in England, gave some additional names to already known species; his *R. florida* being *R. Carolina*, the *R. Cherokeeensis* the same as *R. lævigata*, and his *R. fenestrata* the smooth form of *R. setigera*.

Sir James E. Smith in his revision of the genus in Rees' Cyclopædia (1816) describes fifty-seven species, of which eleven are credited to America; but these include *R. gemella*, *R. Lyonii*, *R. pendulina*, and *R. lævigata*, and *R. rubifolia* as well as *R. setigera*,—thus leaving but six actual native species. Under *R. Carolina* ("common in our shrubberies") he mentions "*R. Pennsylvanica* of the gardens."

In 1817 *R. Montezumæ*, HBK., discovered by Humboldt and Bonpland in the high mountains of Mexico (but in all probability only a naturalized form of the European *R. canina*), was described by them, and also figured by Redouté in *Les Roses*. This latter work, published between 1817 and 1824, the text by Thory, included figures of *R. lucida*, *R. parviflora* (double), *R. rubifolia*, *R. Carolina*, and of several forms of the latter under the name of *R. Hudsoniana*. *R. blanda* is referred to *R. cinnamomea* as a variety. Two other publications illustrating the genus appeared early in the century, which have not been accessible to me; viz., Roessig's *Die Rosen* (1802–1820), containing figures of *R. Carolina* and "*R. Virginiana simplex*," and Andrew's *Roses* (1805–1828).

Of far more value is the *Rosarum Monographia* of Lindley (1820), in which both the grouping of the species and the descriptions are more satisfactory than anything that had preceded, and are accompanied by several figures that are in most cases excellent. He admits fourteen American species, viz. *R. nitida* (or "Dwarf Labrador Rose"), *R. rapa* ("as distinct from *R. lucida* as a species can be;," he speaks of specimens from the Southern States, probably *R. humilis*), *R. lucida* and *R. laxa*, Lindl., *R. parviflora* ("a universal favorite"), *R. Woodsii*, Lindl., *R. Carolina*, *R. blanda* and *R. fraxinifolia* (the smooth form of *R. blanda*), *R. stricta* (the same as the *R. pendulina* of Linnæus), *R. rubifolia* and *R. setigera*, without perceiving them to be the same, *R. lævigata* (believing it a native of Georgia, he tries to distinguish this from *R. Sinica*), and *R. Montezumæ*. His *R. laxa* appears, from his figure and description, to be a glaucous garden form of *R. lucida*. The *R. Woodsii*, said to be a native of the country near the Missouri, was described from a cultivated specimen. It had previously been sent to France by an English nurseryman as an American rose with black and yellow flowers, and had so been advertised

under the name of *R. lutea nigra*. It was afterward (in 1825) more correctly described by Lindley, with a good figure, in the Botanical Register (t. 976), and is readily identified with a western species otherwise unnamed. Lindley also described in the *Monographia* his *R. acicularis*, a Siberian species which is now known to occur in Alaska, and is closely allied to *R. blanda*. He states that *R. blanda* had been collected on the Northwest Coast by Menzies, who was with Vancouver upon the island which bears that navigator's name, and who there doubtless found the common species afterward named by Presl *R. Nutkana*.

In the same year with Lindley's monograph appeared that of Rafinesque, who follows Pursh, with the addition of *R. Evratina* and his own early *R. enneaphylla*, and descriptions of fifteen new species from east of the Mississippi. These it is unnecessary to enumerate, though they were taken up by Seringe, and, following him, by Don and Dietrich, and are even discussed by Crepin.

In 1823 was published James's account of Long's expedition to the Rocky Mountains, in which a description is given by Bradbury of a rose collected by Dr. Baldwin near the mouth of the Missouri River, under the name of *R. mutabilis*. Beck soon after identified this with Michaux's *R. setigera*, and correctly, as is shown by the original specimen preserved in the Torrey herbarium.

In 1823 also appeared Trattinnick's *Rosaceæ*, with a detailed account of the Roses, based, however, solely upon the descriptions and figures of previous publications. He found occasion to substitute *R. Solandri* for *R. fraxinifolia* as understood by Lindley, *R. Raffinesquejana* for Rafinesque's *R. flexuosa*, and *R. Sprengeliana* for a form of *R. Carolina* in German gardens, which Sprengel had named *R. Virginica*; but otherwise admits nearly every American species that had come to his knowledge, — twenty-four in all. The revisions in 1825 by Sprengel in the sixteenth edition of the *Systema Vegetabilium*, the less complete one of Loiseleur in the *Nouveau Duhamel*, and even that of Seringe in De Candolle's *Prodromus*, are of little more critical value. Sprengel follows Lindley, substituting *R. Lindleyi* for *R. laxa* (as a preoccupied name); Loiseleur refers Michaux's *R. Pennsylvanica* to the European *R. majalis*, as a variety, and his *R. setigera* to *R. arvensis*; Seringe follows Sprengel, but drops *R. gemella*, refers *R. pendulina* to *R. alpina* as an American variety, and places *R. blanda* under *R. fraxinifolia*, which he confines to the Northwest Coast. He also substitutes *R. Rafinesquii* for *R. nivea*, one of Rafinesque's new species, all of which are given by him.



American botanists up to this time had accepted Pursh as their authority, and the lists (in 1818) of Muhlenberg in his *Catalogue*, and of Nuttall in his *Genera*, as well as the species adopted by Amos Eaton in his *Manual* of the same year, are taken from him with little change. Muhlenberg, however, knew actually of but two native species in Pennsylvania, though he failed to identify them correctly, as appears from the manuscript of his unpublished *Flora*, now in the library of the Gray herbarium, in which he describes "*R. Caroliniana*" and "*R. corymbosa*," the first evidently being *R. humilis* and the last *R. Carolina*. Barton also, in his *Compendium* (1818), as afterward Darlington in his *Florula Cestrica* (1826) and *Flora Cestrica* (1837), recognized only the same two species, understanding them rightly. Elliott, in the *Botany of South Carolina and Georgia* (1821), describes from personal knowledge only two native species, "*R. parviflora*" and "*R. lucida*" (i. e., *R. humilis* and *R. Carolina*), with the introduced *R. lævigata* and *R. suaveolens* (*R. rubiginosa*), to which he adds Michaux's *R. setigera*, and *R. gemella*, *R. Carolina*, and *R. lutescens*, taking the descriptions from Pursh and Smith. Torrey, in his *Flora of the Northern and Middle States* (1824), and in the *Compendium* (1826), gives as native species *R. parviflora*, *R. nitida*, *R. lucida*, *R. gemella*, and *R. Carolina*, the descriptions taken from Willdenow. *R. nitida* and *R. gemella* he had never seen, but the other species he describes in the *Flora* more in detail, and with his usual accuracy.

In 1823 an expedition to the Red River of the North was sent out by the Secretary of War (J. C. Calhoun), under Major Long, who reached Lake Winnipeg and returned by the northern shore of Lake Superior. In Keating's account of the expedition (1825), Schweinitz gave a list of the plants collected, and among them described *R. Sayi* as a new species. This has been considered a form of *R. blanda*, or of *R. acicularis*, but it is, in my opinion, distinct. In 1827 Chamisso and Schlechtendal published in *Linnæa* the first described species from the Pacific Coast (*R. Californica*), which had been collected in 1816 near San Francisco by Chamisso while attached to the Russian expedition under Kotzebue.

The first discussion of the roses found outside of the Atlantic States was by Borrer, an English botanist, in Hooker's *Flora Boreali-Americana*, in 1831, and included all the species that had been collected in British America by Banks, Richardson, Drummond, Douglas, Menzies, Scouler, and others. He evidently found difficulty in determining the species satisfactorily, and the specimens of the same col-

lectors that are in our herbariums show in most cases how far it was done successfully. Of his *R. nitida*, *R. lucida*, *R. Woodsii*, *R. Carolina*, and *R. blanda* in part, there can be no doubt. Some specimens that I would now place under *R. Sayi* are referred to *R. blanda*, and others to *R. stricta*, var. The species of the Northwest Coast (*R. Nutkana*) is referred in part to *R. fraxinifolia*, following Seringe in the *Prodromus*, and in part to *R. cinnamomea*. Some specimens of *R. Woodsii* are referred to *R. majalis*; and it is probable that the specimens from Lake Huron named *R. laevigata*? were *R. setigera*.

The next revision of any moment is that by Torrey & Gray, in the *Flora of North America* (1840). Here *R. setigera* is for the first time identified with *R. rubifolia*, and *R. Carolina*, *R. nitida*, and *R. blanda* (mainly) are clearly defined, while *R. lucida* is made to include all other forms of the Atlantic States. *R. Woodsii* and *R. Californica* are adopted with no other knowledge of them than that derived from the original descriptions; while *R. cinnamomea*, *R. fraxinifolia*, and *R. stricta* are taken from Borrer, with little variation, for the then little known western and northern forms. In addition, two remarkably distinct species of Nuttall's are for the first time described; viz., *R. foliolosa*, from Arkansas and Texas, and *R. gymnocarpa*, from Oregon. No reference is made to Schweinitz's *R. Sayi*, which is first noticed by Eaton & Wright, in the eighth edition of Eaton's *Manual* (1840), who otherwise follow Borrer, adding *R. parviflora*, *R. gemella*, and *R. rubifolia*.

*R. Maximiliani*, collected by Prince Maximilian von Wied in a journey to the Upper Missouri, and published by Nees von Esenbeck in 1841, is the same as Lindley's *R. Woodsii*, as is evident from Nees's careful description.

Torrey, in 1843, in the *Flora of New York*, described the three species of that State as *R. Carolina*, *R. lucida*, and *R. blanda*, his *R. lucida* being the common *R. humilis*, from which he failed to distinguish such specimens of the rarer *R. lucida* as he may have seen. In New England, where *R. lucida* is frequent, the difficulty in uniting the species was greater, and we accordingly find Emerson in the *Woody Plants of Massachusetts* (1846) recognizing *R. lucida* (the "early Wild Rose," *R. humilis*), *R. Carolina* (the "Swamp Rose"), and *R. nitida* (the "Shining Rose"), the last including the real *R. lucida*. Wood in his *Class-Book* (1846, and later editions) includes *R. lucida* under *R. Carolina*, his *R. lucida* also being *R. humilis*. Finally, Dr. Gray, who in the first edition of his *Manual* (1848) had retained *R. nitida* as distinct, in the second (1856) and later editions

refers all three forms (*R. lucida*, *humilis*, and *nitida*) to one species, *R. lucida*. So also in the Southern States, the "Dwarf Rose" of dry soils and woods, which A. M. Curtis had correctly known in 1834 as *R. parviflora*, was called *R. lucida* by him in his *Shrubs of N. Carolina* (1860), and by Chapman in the *Flora of the Southern States*, of the same year.

The most thorough treatise upon any portion of the genus that had yet appeared was that of C. A. Meyer, *Ueber die Zimmtrosen*, in 1847. He discusses the comparative value of different characters, and is the first to distinguish the *Carolina* group of species ("*Rosæ operculatæ*") as distinct from *R. blanda* and its allies. His determinations, however, are of less value respecting our species from the want of material and his consequent dependence upon the work of others. The species placed by him in his section of Cinnamon Roses are *R. blanda*, *stricta*, *Woodsii*, and *Californica*.

In 1849 Presl described in the *Epimeliæ* under the name of *R. Nutkana*, and from specimens that had been collected by Haenke on Vancouver Island early in the century, the same species that had been collected previously by Menzies and by various collectors afterwards, and which had been referred both to *R. fraxinifolia* and to *R. cinnamomea*. Presl's name was long overlooked, until brought forward by Crepin.

At about this time began the long series of collections that have been made in our western territories, mainly in connection with government expeditions and surveys. The determination of the roses of these collections was attended with the usual difficulties. While Nuttall's *R. foliolosa* and *R. gymnocarpa* were easily recognized, the general reference of all the other forms of the interior and of California was to *R. blanda*. In the Botany of Whipple's Report, Dr. Torrey refers to that species not only *R. fraxinifolia* (i. e., *R. Nutkana*), but *R. Californica* and *R. Woodsii*. Three species at the most were at any time recognized, — the large-flowered northern *R. fraxinifolia*, the *R. Californica* of the coast, and *R. blanda*, which included all the rest. In 1872 Dr. Gray gave the name *R. pisocarpa* to a rose collected by Hall on the Lower Columbia, and in 1874 Porter in the *Flora of Colorado* separated, under the name of *R. Arkansana*, a common form of the Rocky Mountain region that had been collected long before and often, from Texas to British America.

The most important publication of all upon American roses has been in the *Primitiæ Monographiæ Rosarum* of Crepin, during 1875 and 1876, — a general work upon which he is still patiently laboring.

Considering the limited amount of material at his command, his work is excellent, though as yet in a measure tentative and provisional, and with a tendency to multiply species. He has examined critically all the specimens of Willdenow's original herbarium, and has clearly defined the characters by which the early species are to be distinguished, and he was the first to perceive and indicate the limited range of *R. lucida*. His disposal of the northern and western species may be thought less satisfactory. He places under *R. blanda* all the pubescent and acicular and even the spiny western forms which correspond to Lindley's *R. Woodsii* and to the *R. Arkanšana* of Porter, while the resinous-pubescent and acicular form he prefers to consider a variety of *R. acicularis*, though at first thought distinct and named *R. Bourgeauiana*. He revives Presl's *R. Nutkana*, but would separate two of its forms under the names *R. Aleutensis* and *R. Durandii*, the latter based upon some peculiar specimens of Hall's collection that had been referred by Dr. Gray to *R. Kamtschatica*. Finally, upon a specimen collected by Fendler in New Mexico he proposes, with some doubt, a new species as *R. Fendleri*. His general arrangement of our species is under the following sections:—

1. SYNSTYLÆ.—*R. setigera*.
2. ALPINÆ.—*R. acicularis* and *blanda*.
3. CINNAMOMEÆ.—*R. Nutkana*, *Durandii*, *Aleutensis*, *Californica*, and *Fendleri*?
4. CAROLINÆ.—*R. Carolina*, *lucida*, *nitida*, *parviflora*, and *foliosa*.
5. GYMNOCARPÆ.—*R. gymnocarpa*.

A still later revision is that of Regel of St. Petersburg, in his *Tentamen Rosarum Monographiæ* (1877). He retains *R. blanda*, *R. Carolina*, *R. lucida*, *R. nitida*, and *R. Woodsii*. To *R. Woodsii* he refers *R. Nutkana*, *R. Lyonii* of Pursh, and some Asiatic forms; and to *R. Carolina* the *R. Californica* of Cham. & Schlecht., proposing another *R. Californica*, Regel, on specimens collected near San Francisco by Tiling. He refers to *R. acicularis*, var. *Gmelini*, Crepin's var. *Bourgeauiana*; *R. gymnocarpa* to *R. pimpinellifolia*; *R. fraxinifolia* to *R. cinnamomea*; *R. setigera* to *R. moschata*, but *R. rubifolia* to *R. repens*; and *R. Montezumæ* to *R. canina*.

In 1880 *R. minutifolia*, a very peculiar species from Lower California, was described by Engelmann in Coulter's Gazette, and *R. spithamea* by myself in the Botany of California, the latter probably only an extreme form of *R. Californica*. And last of all, in 1881, Palmer

found in the mountains of Coahuila, Mexico, a rose that was described the next year in my list of his collection under the name of *R. Mexicana*.

The material at hand in the preparation of the following revision, while none too ample for correct results, has been enough at least to furnish all that was desired of dubious and difficult forms. The collections that have been examined, besides those of the Gray Herbarium, have included the large accumulations of Dr. Engelmann, those of the Torrey Herbarium, of the Philadelphia Academy of Sciences, of the Department of Agriculture at Washington, and of the Arnold Arboretum, besides the private collections of J. H. Redfield, of Philadelphia, H. G. Jesup, of Hanover, N. H., and J. Donnel Smith, of Baltimore, and contributions from Dr. A. Gattinger of Nashville, Dr. C. Mohr of Mobile, Howard Shriver, of Wytheville, Virginia, and Warren Upham of Minneapolis.

*Classification, Synopsis, and Descriptions of Species.*—The differences which have to be taken into consideration in determining the species of the genus *Rosa* are so variable, and present such a multitude of combinations, that there are few genera which illustrate more fully the different views that can be taken by different botanists respecting the specific value of the same characters. The number of species admitted by Linnæus in 1762 was fourteen; by Sir J. E. Smith in 1816, fifty-seven; by Lindley in 1820, seventy-eight; by Seringe in 1825, ninety-one, besides fifty-one which he classed as imperfectly known. Bentham & Hooker, in the *Genera Plantarum* (1865), limit the number of species then known to thirty. The number of species credited to Great Britain by Lindley was ten; by Baker (1871), eleven; by Hooker (1871), seven, with six subspecies; and by Bentham, in the same year, five “probably real species.” Déséglise in 1876 makes the whole number of Old World species 410, of which 323 are European (66 in Great Britain), 75 Asiatic, and four African, — eight being of uncertain habitat. Crepin’s revision of the European species (1869) accords in the main, at least provisionally, as respects the weight and number of species, with Déséglise. Nyman in the *Conspectus Floræ Europææ* (1878) enumerates forty European species, with fifty-two subspecies. Regel in his *Tentamen* (1878) recognizes a total of fifty-six species, of which seventeen occur in Europe, thirty-four are Asiatic, and five American, several of our species being referred to foreign types, as we have seen. On the other hand, Gandoger (*Tabulæ Rhodologiæ Europæo-Orientales*, 1881) distributes the Old World forms into twelve genera and 4,266 species.

A perfect agreement of opinion respecting the roses of America is therefore not to be expected. In the following revision eighteen species are recognized. Some of these are very clearly defined, while others are more nearly related and are united more or less closely by intermediate forms, or diverge into extremes in one or more directions. There has seemed to be no necessity for proposing a single new species, though it would have been easy to increase the number largely. But if farther subdivision were attempted, it would be difficult to say where it should stop.

In the general grouping I have followed nearly that of Crepin. The species divide naturally into two series, one having the sepals persistent or breaking away at length by an irregular rupture above the base, in the other the sepals deciduous from the receptacle by a clean circumscission at the base. The first divides again into two groups, the one without and the other with infrastipular spines. The unarmed group ranges from extreme Northern Alaska to Hudson's Bay, Newfoundland, and the northern border of the Atlantic States, and southward along the Rocky Mountains to Colorado, as also westward through Northern Asia and Europe to Scandinavia. This may be considered all one species (*R. blanda*), or it can be divided into four fairly well-defined species, which may well be believed to be derivatives from one common stock. The second group ranges from Alaska along the coast to Lower California, and through the interior to Western Texas and the plains east of the Rocky Mountains. The extreme northwestern and southwestern forms (*R. Nutkana* and *R. minutifolia*) are well defined, the latter remarkably so. The four remaining species are closely related and run into each other more or less, the most eastern one showing in its lobed sepals a gradation toward the Atlantic *Carolina* group.

The second series, with deciduous sepals, has two strongly characterized outlying members, the eastern climbing species with connate styles (*R. setigera*), and the western *R. gymnocarpa*, with its receptacle becoming perfectly naked and closed in fruit. Two other related but apparently distinct species occur in the extreme Southwest and in adjacent Mexico; but the four remaining species, occupying the region east of the Mississippi, are again very close allies.

The extreme of possible reduction would seem therefore to be to nine species, viz.:—

1. *R. blanda*. (*R. acicularis*, *R. Sayi*, *R. Arkansana*.)
2. *R. Nutkana*.
3. *R. Woodsii*. (*R. Californica*, *R. Fendleri*, *R. pisocarpa*.)

4. *R. minutifolia*.
5. *R. Carolina*.
6. *R. humilis*. (*R. lucida*, *R. nitida*.)
7. *R. foliolosa*. (*R. Mexicana*.)
8. *R. setigera*.
9. *R. gymnocarpa*.

A synopsis of the grouping and differentiation of the species, as here adopted, may be made as follows, exceptions being disregarded :—

### SYNOPSIS OF SPECIES.

#### I. — Sepals connivent and persistent after flowering.

A. — Without infrastipular spines ; acicular prickles often present. Pedicels and receptacles naked.

\* Fruit oblong. Arctic.

1. *R. ACICULARIS*. Stipules dilated ; leaflets usually 5, obtuse or cordate at base, not resinous : flowers solitary ; sepals entire, not hispid. — Northern Alaska.

\* \* Fruit globose. More southern.

2. *R. BLANDA*. Prickles usually few or none : stipules dilated ; leaflets 5 or 7, cuneate at base and petiolulate, simply toothed, not resinous ; flowers corymbose or solitary ; sepals hispid, entire. — Newfoundland to Lake Superior.

3. *R. SAYI*. Very prickly : stipules dilated ; leaflets 5 or 7, sessile and obtuse or subcordate at base, resinous and doubly toothed : flowers solitary ; outer sepals laterally lobed, not hispid. — Colorado to British America and Lake Superior.

4. *R. ARKANSANA*. Very prickly : stipules narrow ; leaflets 7 to 11, subcuneate at base, simply toothed, not resinous : flowers corymbose ; sepals not hispid, the outer lobed. — Western Texas to British America.

#### B. — Infrastipular spines present, often with scattered prickles.

\* Pedicels and receptacles naked. Leaflets 5 or 7.

+ Sepals entire.

++ Flowers and fruit large, solitary. Stipules dilated.

5. *R. NUTKANA*. Spines stout, straight or recurved : leaflets rounded at base : fruit globose. — Alaska to Oregon and Idaho.

++ ++ Flowers and fruit corymbose or solitary, smaller. Stipules short and narrow.

6. *R. PISOCARPA*. Spines straight, slender, ascending or spreading : leaflets rounded or subcuneate at base : fruit globose, small. — Oregon and Washington Territory.

7. *R. CALIFORNICA*. Spines stout, straight or recurved : leaflets obtuse at both ends, often villous, as also the pedicel and receptacle : fruit ovate, with a prominent neck. — Oregon to Lower California.

8. *R. FENDLERI*. Spines straight or recurved : leaflets cuneate at base, not villous : fruit globose. — From the Sierra Nevada and Cascades to the Rocky Mountains.

+ + Outer sepals laterally lobed.

9. *R. WOODSII*. Spines slender, straight or recurved: stipules short: flowers corymbose or solitary, on very short pedicels: fruit globose. — Colorado to British America and the Mississippi.

\* \* Receptacle densely prickly. Sepals pinnatifid.

10. *R. MINUTIFOLIA*. Very spiny and prickly: stipules short, narrow; leaflets very small: flowers small, solitary, on very short pedicels: fruit globose. — Lower California.

II. — Sepals spreading after flowering and deciduous. Infrastipular spines present, often with scattered prickles.

A. — Styles distinct, numerous, persistent. Base of the calyx persistent on the globose fruit. Calyx, receptacle, and pedicel hispid. Teeth simple and pubescence not resinous, except in *R. Mexicana*.

\* Pedicels usually elongated, and leaflets seven. Eastern species.

+ Leaflets finely many-toothed.

11. *R. CAROLINA*. Tall, with stout straight or recurved spines: stipules narrow; leaves dull green: flowers corymbose or solitary; outer sepals occasionally lobed. — Nova Scotia to Florida and the Mississippi.

+ + Leaflets coarsely toothed.

12. *R. LUCIDA*. Often tall, with stout straight or recurved spines: stipules dilated; leaflets smooth and shining above: flowers corymbose or solitary; outer sepals frequently lobed. — Newfoundland to New York.

13. *R. HUMILIS*. Low, with straight slender spines: stipules narrow: flowers corymbose or solitary; outer sepals always lobed. — From the Atlantic coast to the Mississippi.

14. *R. NITIDA*. Low, with straight slender spines and very prickly: stipules dilated; leaflets glabrous: flowers mostly solitary; sepals entire. — Newfoundland to New England.

\* \* Pedicels very short: leaflets and stipules narrow: flowers solitary; outer sepals lobed.

15. *R. FOLIOLOSA*. Spines short, straight or curved: leaflets 7 to 11, glabrous or nearly so. — Indian Territory to Texas.

16. *R. MEXICANA*. Spines stout, straight: leaflets 5 to 7, resinous beneath and doubly toothed. — Coahuila, Mexico.

B. — Styles connate into a smooth slender column, persistent. Sepals short; base of the calyx persistent.

17. *R. SETIGERA*. Climbing, with stout recurved spines and no prickles: stipules very narrow; leaflets 3 or 5: flowers corymbose: fruit oblong to globose. — Ontario to the Gulf of Mexico.

C. — Styles few, distinct, the summits with the calyx deciduous from the very contracted top of the smooth receptacle. Sepals short.

18. *R. GYMNOCARPA*. Spines straight, slender: stipules narrow; leaflets doubly serrate: flowers small, solitary or few. — British Columbia to Western Montana and California.



I. — Sepals connivent after flowering and persistent upon the receptacle.

A. — Stems without infrastipular spines, naked or more or less covered with slender prickles. Pedicel and receptacle naked.

\* Fruit oblong. Arctic species.

1. *R. ACICULARIS*, Lindl. Stems low, often densely prickly: stipules very broadly dilated, or narrow, glandular-ciliate; leaflets 3 to 7 (usually 5), broadly elliptical and obtuse or acutish, to narrowly oblong and acuminate, more commonly oblong-lanceolate, mostly obtuse or slightly cordate at base and sessile, coarsely simply or occasionally somewhat doubly serrate, often entire below the middle, glabrous above, paler and more or less tomentose beneath, the terminal 1 or 2 inches long; rhachis glabrous or pubescent, unarmed: flowers solitary; sepals nearly glabrous, not hispid, entire: fruit 6 lines long, contracted above into a neck. — Ros. Monogr. 44, t. 8. *R. Carelica*, Fries; Fl. Dan. Suppl. t. 75.

HAB. Northern Alaska; also through Siberia and in Northern Europe. — At Fort Yukon (*Ketchum*); Fort Simpson (*Onion, Kennicutt & Hardisty*); Kuskokoin Valley (*Weinmann*); St. Michel's Island (*Turner*); and on the Kowak River (*McLenegan*).

Only flowering specimens of this species have been seen from Arctic America, but these accord closely with the figures and with Lindley's and Meyer's descriptions, and with some of the Old World specimens that are so named in Herb. Gray. The young receptacle varies somewhat in form, but is usually distinctly elongated. The flowers are  $1\frac{1}{2}$  to 2 inches broad, deep rose-color and fragrant; they are said to be sometimes two or three together. The leaves vary much in form, but incline to a rather peculiar oblong shape, most strongly serrate toward the summit. The sepals are described as sometimes hispid in Asiatic specimens, or with a narrow lateral lobe, and the leaf-stalk as sometimes prickly.

\* \* Fruit usually globose. More southern species.

2. *R. BLANDA*, Ait. Stems 1 to 3 feet high, wholly unarmed, or with usually a few slender straight scattered prickles, sometimes more densely prickly: stipules dilated, naked and entire, or slightly glandular-toothed above; leaflets 5 to 7 (very rarely 9), usually oblong-oblancoate, mostly cuneate at base and shortly petiolulate, coarsely simply toothed, glabrous above, paler and glabrous or more or less pubescent beneath, not resinous or very rarely slightly so, usually large (the terminal  $\frac{3}{4}$  to  $2\frac{1}{2}$  inches long); rhachis pubescent, sometimes sparingly prickly: flowers large, corymbose or often solitary; sepals entire, shortly hispid or sometimes naked: fruit globose with more or less of a neck below the calyx, sometimes oblong-obovate by a more gradual attenuation of the base, 4 to 6 lines long. — Hort. Kew. 2. 202; Jacq. Fragm. t. 105. *R. fraxinifolia*, Gmelin; Lindl. Bot. Reg. t. 458. *R. Solandri*, Tratt. Ros. 2. 150.

HAB. On rocks, and rocky shores of rivers and lakes, from Newfoundland and Hudson's Bay to Northern New York, Illinois, and Wisconsin, and to Lake Winnipeg. — Quebec (*Mrs. Percival*); Vermont, banks of Winooski River and Lake Champlain (*Pringle*); New York, Hudson River near Troy (*Jesup*), Watertown (*Gray*); Michigan (*Houghton*), at Mackinaw Island (*Dr. Wright, Drake*); Canada (*Richardson*); Ontario, and at Thunder Bay (*Macoun*); Illinois, at Fountaindale (*Bebb*), La Salle (*Engelmann*), and Waukegan (*Sargent*); Wisconsin (*Douglass, Hale, Lapham*), White Fish Bay (*Gillman*), and Ashland (*Engelmann*); Minnesota, at Duluth (*Engelmann*), with the sepals both densely hispid and nearly smooth; Manitoba, at Fort Garry (*Bourgeau*). Originally reported as found by Sir Joseph Banks about Hudson's Bay and in Newfoundland. Macoun also reports it from Harbor Grace, Newfoundland, and on Pictou and Magdalen Islands.

Flowers pale rose-color, two inches broad. The typical smooth and slightly prickly form is the more common eastward. The more tomentose form, which was considered the typical form by Lindley, and named *R. Solandri* by Trattinnick, is the var. *pubescens* of Crepin. Of the state with more abundant prickles he makes the var. *setigera*, though including also under it what is here separated as *R. Arkansana*. Both of these forms are more frequent westward, where also the sepals are sometimes naked.

3. *R. SAYI*, Schwein. Stems usually low (1 or 2 feet high), thickly covered with prickles: stipules usually dilated, glandular-ciliate and resinous; leaflets 3 to 7 (usually 5 or 7), glabrous or slightly pubescent above, more or less resinous beneath, broadly elliptical to oblong-lanceolate, usually sessile and rounded or subcordate at base, more or less doubly and glandular-toothed, the terminal  $\frac{3}{4}$  to 2 inches long: flowers solitary (very rarely 2 or 3); outer sepals with one or more very narrow lateral lobes (very rarely all entire), not hispid or slightly so on the margin: fruit as in the last. — Keating, Long's Exped. Appx. 113. *R. acicularis*, var. *Bourgeauiana*, Crepin, Prim. Monogr. Ros. in Bull. Soc. Bot. Belg. 15. 390.

HAB. Frequent in the Rocky Mountains from Colorado to British America, and on Lake Superior and northward. — Colorado (*Parry, Hall & Harbour*), on Clear Creek and Douglas Mountain above Empire (8,500 to 10,500 feet altitude), at Twin Lakes, and in Berthoud's Pass (*Engelmann*), Sangre de Cristo Pass (*Hooker & Gray*), Mosquito Pass and Twin Lakes (*Wolf, Coulter*), Idaho Springs (*Greene*), Manitou Springs (*Engelmann & Sargent*), Breckenridge (*Brandegee*), on the Upper Platte (*Fremont*); British America, at the base of the Rocky Mountains (*Drummond, Bourgeau*), on the Mackenzie River, and at Cumberland House Fort on the Saskatchewan (*Richardson*); Ontario, at Nipigon (*Macoun*), and Silver Islet in Lake Superior (*Gillman*); Wisconsin (*Hale*), south shore of Lake Superior (*Whitney, Loring*), and White Fish Bay (*Gillman*); Northern Michigan, Eagle River (*Gillman*). The locality is not given for the original specimens of *R. Sayi*, which are now in the Schweinitz herbarium in the possession of the Philadelphia Academy. The route of Long's Expedition followed the Red River to Lake Winnipeg, and thence passed through the Lake of the Woods and along the northern shore of Lake Superior.

The flowers are large (2 to 2½ inches broad), and fragrant. The species commemorates the naturalist, Thomas Say, the collector of Long's party.

4. *R. ARKANSANA*, Porter. Stems usually low ( $\frac{1}{2}$  to 6 feet high), more or less densely prickly: foliage more or less glaucous, the stipules usually narrow, more or less glandular-toothed above and sometimes glandular-ciliate; leaflets 3 to 5 pairs (usually 7 or 9), broadly elliptical to oblong-ob lanceolate, somewhat cuneate at base, nearly sessile or often petiolulate, glabrous, or more or less pubescent beneath, simply and coarsely toothed, or the pubescence sometimes resinous and the teeth rarely serrulate, the terminal  $\frac{1}{2}$  to 2 inches long: flowers corymbose, very rarely solitary; sepals naked or sometimes more or less hispid, the outer with one or more lateral lobes: fruit as in the preceding. — Porter & Coulter, Syn. Fl. Colorado, 38. *R. blanda*, var. *setigera*, Crepin, l. c. 394, mainly.

HAB. Very frequent in the mountains from Western Texas and New Mexico to British America, and eastward to the Upper Mississippi and Saskatchewan. — Western Texas, on the Limpio (*Wright, igelow*); New Mexico, at Sante Fe (*Fendler, Engelm.*), and Las Vegas (*Engelm., G. R. Vasey*); Colorado, on the Arkansas at Cañon City (*Brandegee*), at Hot Sulphur Springs, Manitou Springs, and Empire (*Engelm.*), Colorado Springs (*Torrey, Redfield*), Twin Lakes (*Wolf*), Sangre de Cristo Pass (*Hooker & Gray*), and at Denver (*Engelm., Jones*); Nebraska, on Loup Fork (*Hayden*); Montana (*Ward*), on Frenchman's Creek (*Coues*), Upper Yellowstone (*Allen*), Nevada Creek (*Sargent*), and Hound Creek (*Scribner*); Dakota, at Devil's Lake (*Nicollet*), Fort Clark (*Stevens*), Bismarck (*Sargent*), and Pembina (*Havard*), a form very near *R. blanda*; Western Missouri, Cass County (*Broadhead*); Iowa (*Arthur, Coulter*); Minnesota, at St. Paul (*Lesquereux*), near Minneapolis (*Miss Butler, Engelm., Upham*), Pipe Stone City (*Mrs. Bennett*), and Wabasha (*Gibson*); Manitoba, at Brandon (*Scott*); Assiniboine, Souris Plain (*Macoun*); Saskatchewan (*Bourgeau*).

The most pubescent form of this species is common upon dry prairies from the Upper Mississippi westward and to the Saskatchewan. The flowers are here sometimes white. In Eastern Minnesota and Iowa it occurs with the receptacle more or less hispid.

B. — Stems with infrastipular spines, and often more or less covered with scattered prickles.

\* Pedicels and receptacles naked (very rarely hispid).

← Sepals entire.

→ Flowers large, solitary. Fruit large. Stipules usually dilated.

5. *R. NUTKANA*, Presl. Stems stout, 1 to 4 feet high, armed with stout straight or recurved spines, the branches sometimes unarmed, and young shoots sometimes prickly: stipules glandular-ciliate; leaflets 5 or 7 (very rarely 9), broadly elliptical to ovate or oblong or lanceolate, usually rounded at base, obtuse or acute (the terminal  $\frac{1}{2}$  to 2 inches long), resinous beneath (as well as the rhachis and stipules) and the

teeth more or less glandular-serrulate, smoother above, sometimes nearly or quite glabrous (and teeth entire), or the pubescence not resinous; rhachis more or less prickly or hispid: flowers 2 or 3 inches broad, solitary (rarely 2 or 3); pedicel and receptacle very rarely hispid; sepals naked or very rarely hispid: fruit globose, not contracted above into a neck, 6 lines broad. — *Epimel. Bot.* 203. *R. Aleutensis*, Crepin, l. c. 14. 41. *R. Durandii*, Crepin, Bull. Soc. Bot. France (Compt. Rend.), 22. 19.

HAB. Alaska, along the coast from lat. 62° to Oregon, and in the mountains eastward to Idaho and Northern Utah. — Alaska (*Harrington, Turner, Fischer, Kellogg, Meehan*, etc.); British Columbia, on Vancouver Island (*Lyall, Engelmann*), Observatory Inlet (*Scouler*), on Fraser River (*Engelmann*), Columbia Valley (*Dawson*); Washington Territory, on Puget Sound and at Cape Disappointment (*Engelmann & Sargent*), Cowlitz (*Engelmann*), Klickitat County (*Suksdorf*), on the Wenatchee (*Brandegee*), and Fort Colville (*Wilkes, Watson*); Oregon, at Astoria and the Dalles (*Nuttall, Hall, Engelmann, Howell*), Hood River (*Mrs. Barrett, Henderson*), Blue Mountains (*Nevius, Cusick*); Idaho, on the Clearwater (*Wilkes, Spalding*), near Boise City (*Wilcox*); Northern Utah, in the Wahsatch (*Watson*).

A very variable species, though there seems to be no combination of characters upon which it can be satisfactorily divided. The species was originally made upon the nearly glabrous form (including Crepin's varieties *glabra* and *pubescens*), which is of frequent occurrence on the coast, but is the more usual one in the interior. The resinous pubescence is sometimes very dense, and, as in other species, is usually accompanied with serrulate teeth. It is very seldom that either pedicels or sepals, and still more so that the receptacles, are at all hispid. The spines are often very broad at base (on vigorous shoots sometimes a half-inch broad and long). Scattered prickles in addition to the spines are rare. *R. Aleutensis*, Crepin, was based upon a vigorous stem without spines. *R. Durandii*, Crepin, is an extreme form, with very large spines and densely hispid and prickly, and with the foliage very resinous.

A probable form with the fruit and pedicels hispid is found in Western Montana, at Rock Creek in Bitter-Root Valley (*Watson*), unarmed, and at Bozeman (*Koch*), with slender spines.

++ ++ Flowers corymbose or solitary, smaller. Fruit smaller. Stipules short and narrow.

6. *R. PISOCARPA*, Gray. Stems slender, armed with straight stout or slender ascending or spreading spines, or sometimes naked, not prickly: stipules mostly narrow, very rarely slightly glandular on the margin; rhachis pubescent, sometimes prickly; leaflets 5 or 7, oblong to oblong-ovate or -obovate, shortly acuminate to obtuse, rounded or subcuneate at base and sessile or nearly so, smooth above, paler and pubescent beneath, simply toothed, usually small (the terminal 5 to 18 lines long): flowers corymbose, or often solitary on short branches, an inch broad, on short slender smooth or rarely sparingly hispid pedicels;

sepals hispid or sometimes naked: fruit globose, with a very short neck, 4 or 5 lines long. — Proc. Amer. Acad. 8. 382.

HAB. Woods and stream-banks in Western Oregon and northward to British Columbia. — Oregon, Multnomah County (*Hall, Engelmann, Howell, Henderson*); Washington Territory, Klickitat County (*Suksdorf*), Seattle (*Engelmann, Sargent*); British Columbia, Vancouver Island (*Kellogg*).

Rather doubtfully distinguished from forms of *R. Californica* by the somewhat smaller and more globose fruit, and by the spines never recurved but very frequently ascending. Specimens from Thompson River in British Columbia (*Macoun*) may belong here, but are resinous. Wholly or nearly glabrous specimens also, from the Scott Mountains, California (*Greene*), and from Siskiyou County (*Pringle*), can hardly be separated from it, and another collected by the Wilkes Expedition ("Cascade Mountains to the Columbia") would be referred to it but for the somewhat recurved spines.

7. *R. CALIFORNICA*, Cham. & Schlecht. Stems often tall (1 to 8 feet high), with usually stout more or less recurved or sometimes straight spines, frequently scattered, or wanting, often prickly: stipules mostly narrow, usually naked, sometimes glandular-ciliate; rhachis pubescent or prickly; leaflets 3 to 7 (very rarely 9), round or broadly elliptical to oblong-ovate or -obovate, most frequently obtuse at both ends and sessile, slightly pubescent or glabrous above, villous or tomentose beneath, and simply toothed, or often more or less resinous and the teeth either entire or serrulate, very rarely wholly glabrous, the terminal  $\frac{1}{2}$  to  $1\frac{1}{2}$  inches long: flowers corymbose or sometimes solitary (1 to  $1\frac{1}{4}$  inches broad), on slender usually short and naked (or villous or sometimes hispid) pedicels; sepals and receptacle glabrous or villous or rarely hispid (the receptacle very rarely so): fruit ovate-globose, with a usually prominent neck, about 6 lines long by 4 broad. — *Linnaea*, 2. 35.

HAB. Along streams throughout California, in the valleys and Coast Ranges, and in the Sierra Nevada to an altitude of 5–6,000 feet, in Western Nevada, and northward to the Columbia, and probably to British Columbia. — Lower California, near the boundary (*Orcutt*); California, from numerous localities and collectors (*Coulter, Hartweg, Pickering, Wislizenus, Bridges, Bigelow, Parry, Heermann, Dennison, Shelton, Torrey, Brewer, Bolander, Kellogg, Palmer, Hooker & Gray, G. R. Vasey, Rothrock, Congdon, Parish, Engelmann, Sargent, Cleveland, Muir, Redfield, Greene, etc.*); Western Nevada (*H. Engelmann, Watson*, n. 349 in small part, *Wheeler*); Oregon, near Portland (*Engelmann*); Washington Territory (*G. R. Vasey*), Klickitat County (*Suksdorf*); British Columbia, on Thompson River (*Macoun*?).

An exceedingly variable species, in every respect, but it seems impossible to divide it to any good purpose. The villous-pubescent form (var. *Chamissoniana*, Meyer; var. *pubescens*, Crepin) is the typical one, while the one with resinous pubescence and serrulate teeth (var. *Petersiana*, Cham.; var. *glandulosa*, Crepin) is as widely distributed and rather more frequent. The wholly glabrous form

is very rare and found only in the San Bernardino Mountains (*Parish Brothers*), apparently with the ordinary pubescent form. In Northern California and northward it may readily be confounded, when only in flower, with *R. Fendleri* or *R. pisocarpa*. Specimens with a rather peculiar habit and wholly unarmed have been collected in Siskiyou County (*Pringle*). Suksdorf describes it as in his locality nearly thornless, sometimes ten or twelve feet high and two inches thick at base. *R. Californica*, Regel, does not differ from the common pubescent form of the original species.

*R. spithamea*, Watson (Bot. Calif. 2. 444), may be a very extreme dwarf form of the resinous variety, with straight spreading slender spines, the pedicels, receptacles, and sepals densely glandular-prickly, and the leaflets mostly distinctly petiolulate. The fruit has not been collected. It has been found at New Almaden (*Torrey*), near San Luis Obispo (467 *Brewer*), and in Trinity County (*Rattan*). Mr. Rattan speaks of it as "very abundant all the way down the Trinity River from Hyenpom on the South Fork to Hoopa Valley. On the ridge between Burnt Ranch and the Forks of the Trinity it fairly covers the ground under open forests of *Quercus Kelloggii*. There I saw no specimens exceeding eight inches in height. Three to four inches was the common height. The largest I could find, a foot high, grew in the richest most shaded places along the river."

8. *R. FENDLERI*, Crepin. Stems often tall (6 or 8 feet high, or less), with mostly rather slender straight or recurved spines, often scattered, or wanting: stipules and rhachis as in the last; leaflets 5 or 7 (very rarely 9), oblong to oblong-obovate, more or less cuneate at base and often petiolulate, usually glaucous, very finely pubescent beneath or glabrous or somewhat resinous, the teeth usually simple: flowers small, often solitary, the short pedicels, receptacles, and sepals glabrous, or the last subpubescent: fruit globose or broadly ovate, with little or no neck, about four lines broad. — Bull. Soc. Bot. Belg. 15. 452.

HAB. From Western Texas and New Mexico to the Sierra Nevada, and northward to beyond the British Boundary. — W. Texas, near Fort Davis (*Bigelow*); New Mexico, near Santa Fe (*Fendler*), on the Mimbres (*Thurber*), in the Raton Mountains (*Abert*), Sandia Mountains (*Bigelow*), S. Magdalena Mountains (*G. R. Vasey*), and at Mangus Springs (*Rusby*); Arizona, at Trumbull (*Palmer*), and Willow Spring (*Rothrock*); Utah (*Bishop, Ward*), near Salt Lake City (*Engelmann, Jones*); Nevada (*Sargent*), in the Goshoot Mountains (*H. Engelmann*), East and West Humboldt Mountains, etc. (*Watson*), Truckee Valley (*Bailey*), Carson City (*Anderson*); Eastern California, near Mono Lake (*Brewer*), head of Susan River (*Beckwith*), Sierra County (*Lemmon*), Modoc Range (*Sargent*); Oregon, Union County (*Cusick*), Hood River (*Henderson*), and at the Dalles (*Engelmann, Sargent*); Washington Territory, Klickitat County (*Suksdorf*), on the Yakima and Wenatchee (*Brandegee*), Okanagan Valley (*Watson*); Colorado, at Twin Lakes (*Wolf, Engelmann*), and at Hot Sulphur Springs, Middle Park (*Parry, Engelmann*); Wyoming, in the Wind River Mountains (*Fremont*), and on Hoback River (*Richardson*); Montana (*Howard*), at Gallatin City (*Scribner*), on Rock Creek in Bitter-Root Valley (*Watson*), and on Hudson

Bay Creek (*Sargent*); Wyoming, at Carbon (*Britton*); British Columbia, on the Kootanie Trail (*Dawson*).

The species was founded upon the resinous serrulate-toothed specimens collected by Fendler, a form common in Colorado and New Mexico, but the more widely distributed form is wholly without glandulosity. While closely approaching the more finely tomentose and smoother forms of *R. Californica*, it appears to be sufficiently differentiated from it by its more strictly globose fruit (the calyx raised upon a less prominent neck or closely sessile), the pubescence never villous, the receptacle and pedicel always glabrous and sepals never hispid, and the foliage more or less glaucous. The leaves are usually narrower and cuneate at base, never rounded or ovate. As a rule, and as in the other species of the group, the sepals are entire. In a few vigorous specimens, however, from near Salt Lake City, and from Klamath River, California, an occasional lobe is found on the outer sepals.

Specimens which may belong to a distinct species of this group have been collected near Pembina (*Havard*), in the high mountains of Montana (*Swallow*), and near Fort Colville, Washington Territory (*Watson*), distinguished by narrowly oblong fruit (8 to 10 lines long), on mostly solitary naked or hispid short pedicels, the stems (4 inches to 4 feet high) with very slender straight spines. A fuller series of specimens is needed.

+ + Outer sepals usually with one or more lateral lobes.

9. *R. Woodsii*, Lindl. Stems usually low ( $\frac{1}{4}$  to 3 feet high), with slender straight or recurved spines, and sometimes with scattered prickles, or unarmed above: stipules narrow or dilated, entire; leaflets 5 or 7 (sometimes 9), obovate to oblong or lanceolate, rounded or acute at the summit, obtuse or usually cuneate at base, glabrous or subpubescent above, villous or finely pubescent or glabrous beneath (with the rhachis and stipules), simply toothed often only above the middle, sometimes resinous and serrulate-toothed, sometimes glaucous, usually small (the terminal  $\frac{1}{2}$  to  $1\frac{1}{2}$  inches long): flowers ( $1\frac{1}{2}$  to 2 inches broad) corymbose or very often solitary, on very short naked pedicels; sepals naked or hispid, the lobes more or less conspicuous: fruit globose with a short neck, 4 or 5 lines broad. — Monogr. Ros. 21, and Bot. Reg. 12, t. 976. *R. Maximiliani*, Nees, Pl. Maxim. 8. *R. foliolosa*, var. *leiocarpa*, Torr. in Frem. Rep. 89.

HAB. Missouri to Colorado and northward to Western Montana, the Saskatchewan and Slave Lake, chiefly on the plains and in the valleys. — Missouri, Jackson County (*Broadhead*); Nebraska, on White River, Smith's Fork, and in the Bad Lands (*Hayden*); Colorado (*Parry*, *Hall & Harbour*), on the Platte (*Fremont*), near Denver (*Jones*), at Cañon City (*Brandeggee*), at Colorado Springs and near Twin Lakes (*Engelmann*); Southeastern Idaho (*Allen*), and in Beaver Cañon (*Watson*); Montana (*Ward*), on Tongue River (*Roberts*), and in Grass-hopper Valley (*Watson*); Dakota (*Nicollet*, *Culbertson*), at Fort Clarke (*Suckley*), and at Mandan (*Meehan*); Minnesota (*Sykes*), near Minneapolis (*Miss Butler*, *Upam*); Canada, on the Saskatchewan (*Bourgeau*), Slave Lake, etc. (*Richardson*).

Very variable, and in some of its forms nearly approaching *R. Fendleri*. The resinous-pubescent specimens are all from the Platte Valley in Colorado. In the more eastern localities the pubescence is often quite villous. The specific name was given in honor of Joseph Woods, an English botanist, who, according to Lindley, was the first to distinguish the species of roses by their true characters.

\* \* Receptacle densely prickly, and sepals pinnatifid.

10. *R. MINUTIFOLIA*, Engelm. Stems rigidly much-branched, 2 to 4 feet high, armed with numerous at length stout spines, usually terete above the base, straight and spreading or slightly recurved, and with scattered deciduous prickles; internodes of the branches very short: stipules usually very short and narrow, glandular-ciliate; leaflets 3 to 7, very small (the terminal 2 to 5 lines long), rounded to oblong-lanceolate, very coarsely and unequally toothed and the margin revolute, pubescent, less so above: flowers small (an inch broad), always solitary, and the very short pubescent or somewhat prickly pedicel bractless; sepals densely pubescent and with few prickles, shortly appendaged above, the outer pinnately lobed: fruit globose with a very broad orifice, densely prickly, 3 or 4 lines broad. — Bull. Torr. Bot. Club, 9. 97 and 127.

HAB. Lower California; hillsides near the coast, between Sauzal and Ensenada on Todos Santos Bay (*Jones, Orcutt, Parry, Pringle*).

II. — Sepals spreading after flowering, deciduous. Infrastipular spines present (or wanting above), and the stems often more or less covered with scattered deciduous prickles.

A. — Styles distinct, numerous, persistent. Base of the calyx persistent on the globose fruit. Calyx, receptacle, and pedicel hispid. Teeth simple and pubescence not resinous, except in *R. Mexicana*.

\* Pedicels usually elongated. Eastern species.

+ Leaflets finely many-toothed.

11. *R. CAROLINA*, Linn. Stems usually tall (1 to 6 feet high), with stout straight or usually more or less curved spines: stipules long and very narrow, naked or glandular-ciliate; leaflets dull green, 5 to 9 (usually 7), usually narrowly oblong and acute at each end and petiolulate, often broader and sometimes obtuse or acuminate, glabrous or pubescent, usually more or less pubescent beneath (with the naked or prickly rhachis), the terminal 1 to 2½ inches long: flowers corymbose or often solitary, the pedicels rarely naked; outer sepals with occasionally a small lateral lobe: fruit depressed-globose, 4 or 5 lines broad. — Syst. Nat. 10 ed. 1062; Meehan, Native Flowers, 1. 169, t. 43; Sprague & Goodale, Wild Flowers, 147, t. 35. *R. palustris*, Marsh. Arbust. 135. *R. corymbosa*, Ehrh. Beitr. 4. 21. *R. Hudsoniana*, Thory in Redouté, Ros. 1. 95, tt. 35, 112, 116.



**HAB.** Borders of swamps and along streams; from Nova Scotia to Ontario and Minnesota, and southward to Florida and Mississippi. — W. Vermont (*Pringle*); Massachusetts (*Oakes, Jesup, Robinson, Sargent, Watson*); Rhode Island (*Engelmann, Sargent*); Connecticut (*Wright, Jesup*); New York (*Gray, Brown*); New Jersey (*Torrey, Redfield*); Pennsylvania (*Pickering, Redfield, Green, Engelmann*); Ohio (*Riddell, Lapham*); Indiana (*Clapp, Short*); Illinois, on Illinois River (*Geyer, Engelmann*); Wisconsin, at La Pointe (*Engelmann*); W. Missouri (*Broadhead*); Kentucky (*Riddell, Short, Drummond*); Tennessee, at Nashville (*Gattinger*); Maryland (*J. D. Smith*); Virginia (*Rugel, Curtiss, Shriver*); District of Columbia (*Vasey*); N. Carolina (*Engelmann, J. D. Smith*); S. Carolina (*Mellichamp, Bachman*); Georgia (*Say, Wright*); Florida (*Leavenworth, Curtiss*); Mississippi (*Hilgard*). I have seen no specimens from Canada, but Macoun reports it as ranging from Nova Scotia and New Brunswick to the western part of Ontario; specimens from New Brunswick, sent as such, prove to be *R. lucida*. Upham also reports it from several localities in Minnesota, but as infrequent.

A species readily recognized by the fine serration of the leaflets, in connection with narrow stipules and usually hooked spines. Sometimes, however, some leaves may be found as coarsely toothed as in *R. lucida*, and as the two species are often found in New England growing together, hybrids may be expected to occur. The time of flowering is about two weeks later than in *R. lucida*. The hispidness of pedicel and fruit is sometimes deciduous, leaving them nearly smooth.

← + Leaflets coarsely toothed.

12. *R. LUCIDA*, Ehrh. Stems often tall (a few inches to 6 feet high), with at length stout straight or usually hooked spines: stipules usually naked, more or less dilated; leaflets dark green, rather thick, smooth and shining above, often slightly pubescent beneath and on the rhachis: flowers, fruit (4 to 6 lines broad), etc., nearly as in *R. Carolina*; outer sepals frequently with one or two small lobes. — Beitr. 4. 22. *R. laxa*, Lindl. Ros. Monogr. 18, t. 3. *R. Lindleyi*, Spreng. Syst. 2. 547.

**HAB.** Margins of swamps or moist places; from Newfoundland to Eastern New York and Pennsylvania. — Newfoundland (*Osborn*); Cape Breton (*Macoun*); Nova Scotia (*Macoun, Burgess*); New Brunswick (*Fowler, Vroom*); Maine, at Kennebunkport (*Jesup*); Vermont (*Pringle*); Massachusetts (*Oakes, Torrey, Robinson, Sprague, Sargent, Engelmann, Watson*), at Hadley (*Jesup*); Rhode Island (*Engelmann*); Eastern New York (*Nuttall*), at College Point, L. I. (*Schrenk*); Pennsylvania (*Read, Townsend*).

This as it shows itself in New England and eastward appears to be quite distinct both from the last and from the following species; still forms occur (especially in the herbarium) that are sufficiently troublesome to distinguish. The New York and Pennsylvania specimens, though very old and poor, belong here rather than elsewhere, as also some imperfect specimens from a swamp near Wytheville, Virginia (*Shriver*). Dr. Torrey, in his *Flora of the Northern and Middle States* gives as localities for this species only "mountain bogs, Fishkill Mountains, etc., New York; Williamstown, Mass.," but the single specimen from New York in his herbarium is too poor to show the distinguish-

ing characters of the species. In the later *Flora* of the State he considers this species and *R. humilis* identical. The range will probably prove to be somewhat more extended, but all herbarium specimens which I have seen from more western localities that have been referred to this species are clearly referable to *R. humilis*. The fruit is sometimes found oblong-obovate, but in all the cases that I have examined this has been a deformity caused by insects, and attended by a diminished number of seeds. Dr. Torrey in the *Flora of New York* attributes a like variation in *R. Carolina* to the same cause.

13. *R. HUMILIS*, Marsh. Stems usually low (1 to 3 feet) and more slender, less leafy, with straight slender spines, spreading or sometimes reflexed: stipules narrow, rarely somewhat dilated; leaflets as in the last, but usually thinner and paler, glabrous or usually more or less pubescent, especially beneath, and also the rhachis (often prickly): flowers very often solitary, the outer sepals always more or less lobed, often pinnately so: fruit as in the preceding. — Arbust. Amer. 136. *R. parviflora*, Ehrh. Beitr. 4. 21. *R. Lyonii*, Pursh, Fl. 345. *R. lucida*, Auct.; Meehan, Native Flowers, 2. 33, t. 9.

HAB. In dry soil and on rocky slopes and mountain sides; from Maine to Georgia and west to Wisconsin, Missouri, the Indian Territory, and Louisiana. — Maine (*Oakes*); Massachusetts (*Oakes, Jesup, Watson*); Connecticut (*Bishop*); New York (*Eaton, Nuttall, Eggert, Jesup*); New Jersey (*Read, Torrey*); Pennsylvania (*Lea, Read, Whitesides, Redfield, Wolle, Engelmann*); Maryland (*J. D. Smith*); District of Columbia (*Vasey, Ward*); Virginia (*Curtiss, Shriver*); N. Carolina, on Roan Mountain (*Gray*); Georgia (*Mrs. Say, G. R. Vasey*); Ohio (*Baldwin, Morgan, H. P. Smith*); Indiana (*Coulter*); Michigan (*Drake, Clarke, Gillman, Wheeler*); Ontario, Detroit River (*Gillman*); Wisconsin, Dane County (*Hale*); Illinois (*Short, Engelmann, Vasey, Brendel*); Missouri, St. Louis and Jefferson Counties (*Engelmann, Eggert*); Kentucky (*Riddell, Short*); Tennessee (*Gattinger*); Alabama (*Buckley, Kirk, Mohr*); Mississippi (*Hilgard*); Louisiana (*Hale, Carpenter*); Arkansas (*Nuttall, Fendler*); Indian Territory, at Limestone Gap (*Butler*).

A widely distributed and very variable species, but in general readily distinguished. The spines are usually very slender, but on more vigorous plants they may become stouter and somewhat flattened, but are always straight. In a few specimens the leaflets have been found doubly toothed.

14. *R. NITIDA*, Willd. Usually low, nearly or quite glabrous throughout, the straight slender spines often scarcely stouter than the prickles which cover the stem and branches more or less thickly: stipules usually dilated; leaflets bright green and shining, usually narrowly oblong and acute at each end, sometimes broader and obtuse, small (the terminal  $\frac{1}{2}$  to  $1\frac{1}{4}$  inches long): flowers usually solitary (rarely 2 or 3), bright red ( $1\frac{1}{2}$  to  $2\frac{1}{2}$  inches broad), the slender pedicel, receptacle, and calyx densely hispid or glandular-prickly; sepals entire: fruit globose, 4 or 5 lines broad. — Enum. 544; Lindl. Ros. Monogr 13, t. 2. *R. rubripina*, Bosc.

HAB. Margins of swamps and damp woods; Newfoundland to New England. — Maine, Aroostook County (*Miss Furbish*), Kennebunkport (*Jesup*); Massachusetts, Ipswich (*Oakes*), Andover and Middleton (*Robinson*), Wellesley (*Sprague*), Granby (*Jesup*), S. Hadley (*Mrs. Frisbie*). Originally collected in Newfoundland.

A very pretty and distinct species.

\* \* Pedicels very short. Southwestern and Mexican species.

15. *R. FOLIOLOSA*, Nutt. Stems low (6 to 18 inches high), with very short straight or somewhat curved slender or stout spines, or often unarmed; prickles rarely if ever present: stipules narrow, usually glandular-ciliate; leaflets 7 to 11, narrowly or even linear-oblong (the terminal 4 to 15 lines long), acute at both ends, glabrous, or slightly pubescent on the midvein beneath and on the prickly rachis: flowers ( $1\frac{1}{2}$  to 2 inches broad) solitary (or 2 or 3), on nearly naked pedicels 2 to 4 lines long; sepals prickly-hispid, the outer with one or more lobes: fruit depressed-globose, 3 to 5 lines broad. — Torr. & Gray, Fl. 1. 460.

HAB. Prairies and hillsides; Arkansas and Indian Territory to Texas. — Arkansas (*Nuttall*, *Pitcher*, *Bigelow*); Indian Territory (*Woodhouse*, *Engelmann*, *Butler*, *Palmer*); Texas (*Drummond*, *Berlandier*, *Lindheimer*, *Hall*, *Reverchon*).

A very strictly defined species. The flowers are said to be very fragrant. The Florida specimens doubtfully referred to this species by Torrey & Gray are a small-leaved form of *R. Carolina*.

16. *R. MEXICANA*, Watson. Stems low (a foot high or less), with stout straight spreading spines and scattered prickles: stipules narrow, glandular-ciliate; leaflets 5 or 7, mostly narrowly oblong, acute at both ends (the terminal 4 to 8 lines long), glabrous above or nearly so, somewhat resinous beneath, doubly serrate, the rachis hispid and prickly: flowers solitary on hispid pedicels 3 or 4 lines long; outer sepals with a lateral lobe; receptacle glandular-prickly and the globose fruit 3 or 4 lines broad. — Proc. Amer. Acad. 17. 354.

HAB. In the Caracol Mountains, Coahuila, Mexico (2124 *Palmer*).

B. — Styles connate into a slender smooth exerted persistent column. Sepals short, deciduous, the base of the calyx persistent.

17. *R. SETIGERA*, Michx. Stem very tall and climbing, with stout recurved scattered spines, without prickles: stipules very narrow, glandular-ciliate; leaflets 3 or 5, oblong-ovate to lanceolate, shortly acuminate, coarsely and simply serrate, smooth above, usually more or less tomentose beneath, 1 to 3 inches long; rachis glandular-pubescent, sparingly prickly: flowers corymbose, sometimes solitary, on slender hispid pedicels, deep rose-color becoming white, nearly scentless; sepals hispid, lanceolate (4 to 6 lines long), usually with one or

two lateral lobes: fruit oblong-ovate to depressed-globose, 4 or 5 lines long. — Fl. Bor.-Am. 1. 295. *R. rubifolia*, Ait. f. Hort. Kew. 2 ed. 3. 260; Redout. Ros. 3. 71, t. 152; Lindl. Ros. Monogr. 123, t. 15. *R. fenestrata*, Donn. *R. mutabilis*, Bradbury.

HAB. From Ontario and Wisconsin to Northern Texas, and eastward to S. Carolina and Florida. — Ohio (*Short, Sullivan, H. P. Smith*); Illinois (*Mead, Buckley, Eggert, Hall*); Kentucky (*Short, Peter*); Missouri (*Baldwin, Beck, Broadhead, Lindheimer, Engelmann*); Arkansas (*Bigelow, Harvey*); Indian Territory (*Bulter, Palmer*); Northern Texas (*Reverchon*); Louisiana (*Carpenter*); Alabama, Hale County (*Watson*), Mobile (*Mohr*); Georgia (*Chapman*); S. Carolina (*Bachman*). It is credited also to Ontario by Macoun, to Michigan by Torrey & Gray, Austin, Palmer, Wheeler, and Coleman, to Wisconsin by Gray, to Nebraska by Aughey, and to Florida by Chapman, but I have seen no specimens.

Extensively cultivated as Michigan or Prairie Rose, Baltimore Belle, Queen of the Prairie, etc. The more tomentose form is the var. *tomentosa*, Torr. & Gray (*R. rubifolia*, Ait. f.). The flowers are often very numerous, in compound corymbs, the petals varying from 6 to 15 lines in length. The teeth of the leaflets have occasionally a gland-tipped toothlet.

C. — Styles few, distinct, deciduous with the entire calyx from the very contracted top of the naked fruit. Sepals short, entire.

18. *R. GYMNOCARPA*, Nutt. Stem slender and rather weak, 2 to 10 feet high, with straight slender infrastipular and scattered spines, and more or less densely prickly, or nearly naked: stipules usually narrow, glandular-ciliate; leaflets 5 to 9 (usually 7), from round-elliptic and obtuse to narrowly oblong and acute, glabrous (rarely somewhat tomentose or resinous), doubly glandular-toothed, sessile or nearly so, usually small; rhachis more or less prickly and hispid: flowers solitary or few, on hispid or sometimes glabrous pedicels; sepals rarely hispid, usually 3 or 4 (rarely 6) lines long: fruit oblong-obovate (3 to 6 lines long) to globose (3 or 4 lines broad), few-seeded. — Torr. & Gray, Fl. 1. 461; Torr. Bot. Mex. Bound. t. 24. *R. spithamea*, var. *subinermis*, Engelm. in Coult. Bot. Gaz. 6. 236.

HAB. From British Columbia to Monterey and the Yosemite, and in the mountains of Northern Idaho and northwestern Montana. — British Columbia, on Fraser River (*Lyall, Engelmann, Macoun*), and Vancouver Island (*Engelmann, Meehan*); Washington Territory (*Pickering, Brandegee*), at Seattle (*Engelmann*), Falcon Valley (*Suksdorf*), and Fort Colville (*Watson*); Western Oregon (*Douglas, Nuttall, Pickering, Hall, Engelmann, Sargent, Howell*); California (*Bigelow, 94 Bridges, 225 Kellogg & Harford, G. R. Vasey, Engelmann, Mrs. A. E. Bush*), at Yreka (*Greene*), Upper Sacramento (*Hooker & Gray*), Mendocino County and Oakland (*Bolander*), Napa Valley (*Torrey*), mountains above Chico (*Mrs. Bidwell*), Emigrant Gap (*Jones*), Silver Mountain (*Brewer*), at Sisson's (*Gray*), Monterey (*Parry*); Northern Idaho, at Cœur d'Alene Lake and in the Bitter-Root Mountains (*Watson*); Northwestern Montana, at head of Bitter-Root River (*Watson*), Flathead Lake (*Sargent*). It is said in the Botany of the Mexican

Boundary Report to have been collected at San Diego by Parry, and the specimens are so labelled in Herb. Torrey, but this is probably a mistake. Parry's specimen in Herb. Gray is labelled from "Monterey," and is a nearly exact counterpart, and perhaps the original, of the figure given by Dr. Torrey.

The flowers are pale rose-color, sometimes white, usually about an inch broad. The sepals are always entire and rarely with more than a slender acumination, the flower-bud being globose to broadly ovate. An unusual form was collected by me in Northwestern Montana, on the descent from the Rocky Mountains into Ross's Hole at the head of the Bitter-Root River, with larger flowers (2 inches broad), and the sepals as long as the petals. The leaflets vary much in form and size (the terminal 3 to 18 lines long), and frequently have many of the teeth entire. The var. *pubescens*, Watson, is the rare tomentose high-mountain form. Resinous pubescence on the under side of the leaves is more frequent, but still rare.

### *Naturalized Species.*

\* Deciduous Roses, introduced from Europe; flowers pink.

R. CANINA, Linn. *Dog Rose*. Stems armed with stout recurved spines, without prickles, the branches sometimes unarmed: stipules often dilated; leaflets 5 or 7, elliptical or oblong-ovate, often rounded at base, usually an inch long or less, glabrous or somewhat pubescent, simply toothed: flowers solitary (or 2 to 4) on usually naked pedicels; sepals pinnatifid, deciduous: fruit naked, oblong-ovate, rarely nearly globular. — *R. flexuosa*, Raf. *R. Montezumæ*, HBK., Nov. Gen. & Spec. 6. 222; Thory in Redout. Ros. 1. 55, t. 16.

HAB. Roadsides; Eastern Pennsylvania, Tennessee, and probably elsewhere; Mexico.

Readily distinguished from native species by the naked receptacles and pedicels, the small leaves usually obtuse at base, the ovoid fruit, etc. The very slender styles, also, are little exerted beyond the very contracted elevated opening of the receptacle. There can be little doubt that *R. Montezumæ* is only a naturalized form of this species. The specimens from Mexico in our herbariums that have been so named (from highlands west of the city of Mexico, Gregg, Monterey, Coulter, and Toluca, Andrieux) are not distinguishable from *R. canina*. It was referred to *R. canina* as var. *Montezumæ* by Seringe, and the same reference is made by Crepin after examining specimens from several other collectors and localities.

R. RUBIGINOSA, Linn. *Sweetbrier*, *Eglantine*. Resembling the last, but of more compact habit, the leaflets densely resinous beneath and aromatic, and doubly serrate; the short pedicels and pinnatifid sepals hispid; fruit subglobose to oblong-ovate. — *R. suaveolens*, Pursh, Fl. 346. *R. micrantha*, Smith.

HAB. From Nova Scotia to Ontario and southward to S. Carolina and Tennessee; Oregon.

*R. micrantha*, "midway between *rubiginosa* and *canina*" (Hooker), is less strongly scented, the branches longer, fruit narrower, and the styles glabrous.

\* \* Southern Evergreen Roses, from China. Flowers white.

*R. LÆVIGATA*, Michx. *Cherokee Rose*. Climbing, with very stout recurved scattered spines: stipules very short and narrow; leaflets 3, smooth and shining, very sharply serrulate: flowers large, solitary, the pedicels naked or prickly above; sepals entire, somewhat prickly, spreading and persistent: fruit very prickly, oblong-ovate with a long-attenuate base, an inch long or more. — Fl. Bor.-Am., 1. 295. *R. Cherokeeensis*, Donn. *R. Sinica*, Lindl. Ros. Monogr. 126, t. 16 (not Murray, Aiton, etc.); Hook. Bot. Mag. t. 2847.

HAB. Very common in the Southern States, and often used for hedges.

*R. BRACTEATA*, Wendl. *Macartney Rose*. Stem armed with very stout curved spines and glandular-prickly, the branches, calyx, and fruit covered with persistent dense tomentum: stipules and bracts lacinate; leaflets 3 to 9, small, oblong-obovate or elliptical, very obtuse, crenulate-serrulate: flowers solitary, nearly sessile between the bracts: fruit globose.

HAB. South Carolina to Louisiana, but not common.

## 2. Descriptions of some New Species of Plants, chiefly from our Western Territories.

*CIMICIFUGA LACINIATA*. Tall: leaves thin, 3-ternate with the divisions 3-parted or deeply lobed, the acuminate segments coarsely lacinate-toothed, nearly glabrous: panicle thinly tomentose-pubescent; pedicels 1 to 6 lines long: petals usually present, and filaments unequal: ovaries 2 to 5, shortly stipitate, pubescent. — At Lost Lake on Mount Hood, Oregon, at 3,000 feet altitude. Collected by Mrs. P. G. Barrett, of Hood River, in September, 1882, and again in 1884, as also by Mr. L. F. Henderson, of Portland. Resembling *C. elata*, but the leaves more decompose, and the segments more acuminate and coarsely toothed. *C. elata* has also shorter pedicels (scarcely a line long), the flowers apetalous and filaments equal, and the one or two ovaries glabrous.

*CIMICIFUGA ARIZONICA*. Foliage similar to that of the last species, but the leaflets more attenuate at the apex: raceme simple, pubescent or glabrate, the pedicels mostly 1 or 2 lines long, or longer in fruit: petals none: stamens equal: follicles sessile, usually 2 or 3, pubescent, 6 lines long, compressed, many- (about 15-) seeded: seeds densely covered with conspicuous white scales. — In a ravine on the northwest side of Bill Williams' Mountain, Arizona, near the base; collected by

Mr. and Mrs. J. G. Lemmon, in August, 1884. These two western species, as well as *C. elata*, are distinguished from the eastern and Asiatic species of *Eucimicifuga* by the sessile or nearly sessile carpels. In *C. elata* the carpels are 4 lines long and about 10-seeded, the seeds brown and minutely tuberculate.

**ARABIS SUBPINNATIFIDA.** Biennial or apparently sometimes perennial, with a branching base, canescent with a very fine and dense stellate pubescence; stem 6 to 18 inches high: basal leaves crowded and persistent, very narrowly linear-oblongate, entire or sparingly toothed,  $\frac{3}{4}$  to  $1\frac{1}{2}$  inches long; cauline approximate, lanceolate, sessile and more or less sagittate, coarsely and subpinnatifidly toothed: flowers pale pink, 3 to 6 lines long: pods strongly reflexed on pedicels 2 to 5 lines long,  $1\frac{1}{2}$  to  $2\frac{3}{4}$  inches long and 1 to  $1\frac{1}{2}$  lines wide, glabrous or pubescent, attenuate more or less narrowly to the short style. — West Humboldt Mountains, Nevada (76 Watson, in part, referred to *A. retrofracta*); Scott Valley, Siskiyou County, California, E. L. Greene, 1876; Waldo, Southwestern Oregon, Thomas Howell, 1884.

**STREPTANTHUS HOWELLII.** Apparently perennial, glabrous, the stout leafy simple stems a foot high or more: leaves from obovate-spatulate below to narrowly oblong-spatulate above,  $1\frac{1}{2}$  to  $\frac{1}{2}$  inches long: raceme elongated; pedicels 3 to 5 lines long: sepals broad, 3 lines long; petals with an oblong dark purple limb: stigma broad, very short and sessile: fruit unknown. — In the Coast Mountains, near the California line, in Curry County, Oregon; Thomas Howell, June, 1884. Evidently a *Streptanthus*, and of peculiar habit.

**VESICARIA KINGII.** Biennial and perhaps perennial, canescent with a close appressed-scurfy very obscurely stellate silvery pubescence, procumbent: leaves ovate, 2 to 6 lines long, upon an elongated slender petiole, becoming small and spatulate upon the short flowering stems (4 inches long or less): flowers pale yellow, 2 or 3 lines long: pods pubescent, ovate, obtuse, somewhat obcompressed (replum oblong), about 2 lines long, sessile upon the short pedicel (2 to 3 lines long): style  $1\frac{1}{2}$  lines long or less. — West Humboldt Mountains, Nevada (82 Watson, referred to *V. montana*); Lassen's Peak, California, J. G. Lemmon, and Mrs. Austin; Aquarius Plateau, Utah, L. F. Ward (n. 589).

**VESICARIA OCCIDENTALIS.** Resembling the last in habit and pubescence: leaves oblanceolate, attenuate at base, 3 or 4 inches long including the petiole, mostly coarsely sinuate-toothed, the cauline spatulate-oblongate and mostly entire: stems decumbent,  $\frac{1}{2}$  to 1 foot

long or more: flowers yellow, 4 lines long: pod compressed-globose (replum circular), 2 to 4 lines long, sessile upon a more or less flexuous pedicel 4 to 8 lines long: style very slender, about 2 lines long. — Near Yreka, California, E. L. Greene, 1876; Multnomah County, Oregon, T. J. Howell; White Bluffs of the Columbia, Washington Territory, T. S. Brandegee. The allied *V. montana* of the Rocky Mountains has the looser and less silvery pubescence evidently stellate, and oblong or oblong-ovate acute capsules.

**DRABA (CHRYSODRABA) HOWELLII.** Perennial with a branching cespitose base, the scape-like flowering stems about three inches high, sparingly stellate throughout: leaves rosulate, broadly spatulate, rarely obtusely toothed, 3 to 5 lines long: racemes loose, the large bright yellow flowers on slender ascending pedicels 3 to 5 lines long; sepals yellowish,  $1\frac{1}{2}$  lines long; petals 3 to 4 lines long: pod pubescent, oblong, acute, 4 or 5 lines long including the long slender style (a line long). — Siskiyou Mountains, California, Thomas Howell, June, 1884. Resembling forms of *D. alpina*, with larger deep-yellow flowers and longer long-beaked usually unsymmetrical pods.

**ATAMISQUEA EMARGINATA**, Miers (Trans. Linn. Soc. 21. 2, t. 1). This Capparidaceous species, originally discovered by Miers in the province of Mendoza, of the Argentine Republic, and credited to California in Coulter's collection, has been recently found by Mr. Pringle upon the sandy plains bordering the Altar River in Northwestern Sonora. It is here a large shrub, or sometimes a small tree, 15 or 20 feet high, and differing in no respect from the South American form.

**CERASTIUM SERICEUM.** Stems numerous, stout, 1 to 2 feet high, very leafy and densely silky-villous below, branching and glandular-pubescent above: leaves oblong-lanceolate, sessile, an inch or two long, the lower densely villous, the upper less so: panicle spreading and loosely flowered: sepals oblong or lanceolate, scarcely acute, 2 lines long, equalling the petals: capsule nodding, more than twice longer: seeds strongly tuberculate. — Collected in the Huachuca Mountains, Arizona, at 8,000 feet altitude, by Mr. and Mrs. J. G. Lemmon in 1882, and in the Santa Rita Mountains by C. G. Pringle in 1884. The seeds are twice larger and much more coarsely tuberculate than in *C. nutans*, to which it has been referred, though bearing little real resemblance to it.

**ARENARIA (ALSINE) HOWELLII.** A widely branching annual, about a foot high, glandular-hispid, but the internodes usually glabrous: leaves thick, narrowly lanceolate or linear with a clasping base, 6 to 9 lines long, blunt, spreading; bracts green, triangular-ovate to lanceo-



late: pedicels slender: calyx-lobes nerveless, margined, acutish, a line long; petals twice longer, narrowly oblong: capsule ovate, a little exceeding the calyx, 8-seeded: seeds nearly black, turgid, with several rows of minute tubercles along the rounded margins. — In the Coast Mountains, near Waldo in Southwestern Oregon, Thomas Howell, June, 1884. A stouter plant than *A. Douglasii*, and differing in its greater glandulosity, broader leaves and bracts, smaller flowers with nerveless calyx, and narrower capsule, and in the seeds.

**TALINUM BRACHYPODUM.** Perennial, the roots thick, elongated, not tuberous, and the caudex bearing several short leafy stems (1 to 2 inches long): lower leaves scale-like, the upper linear, 3 to 5 lines long: flowers few, axillary near the summit, on very short pedicels (1 or 2 lines long) jointed near the base: sepals acutish, 2 lines long, the bright pink petals twice longer or more: capsule ovate, 2 lines long. — A dwarf showy species allied to *T. aurantiacum*, with nearly sessile flowers. Found near the Indian village Laguna, or "Komack," in Northwestern New Mexico, by Mr. and Mrs. J. G. Lemmon, July, 1884.

**CALANDRINIA OPPOSITIFOLIA.** Root very thick and fleshy: radical leaves linear-oblongate, attenuate to the scarious-margined subterranean base,  $1\frac{1}{2}$  to 3 inches long, the lower cauline (1 to 3 pairs) opposite and similar, with occasionally scattered entire bracts above: stem 3 to 10 inches high, simple or branching, and bearing one or more terminal mostly 3-flowered umbels: pedicels elongated (1 to 3 inches long): sepals orbicular (3 or 4 lines long), acutely dentate but not glandular; petals 10, white or pinkish, 5 or 6 lines long: stamens 8 to 12 or more: style deeply 3-cleft: capsule oblong, 3 lines long, 5-10-seeded. — Collected by Thomas Howell at Waldo, Oregon, and in the Coast Mountains of Del Norte County, California, near Smith River.

**CALANDRINIA COTYLEDON.** Perennial, with thick roots and a stout rootstock crowned with a dense rosette of fleshy spatulate or oblanceolate leaves 1 or 2 inches long and  $\frac{1}{2}$  to 1 inch broad: scape-like stem bearing 2 or 3 lanceolate subscarious bracts below the short cymose panicle, 4 to 8 inches high; bracts glandular-ciliate; pedicels short: sepals orbicular, 2 lines long, many-nerved, the nerves excurrent and gland-tipped; petals 10, deep rose-color, oblanceolate, 6 lines long: stamens 7, equalling the petals, the filaments dilated below and somewhat coherent: style elongated; stigmas 3 or 2: ovary narrowly oblong,  $1\frac{1}{2}$  lines long, 3-4-valved; ovules 12 to 20. — A pretty and well-marked species, collected by Thomas Howell in the Siskiyou Mountains, Del Norte County, California, near the head of Illinois

River, June, 1884. Its resemblance in habit to small species of *Cotyledon* suggests the specific name. In this species, as in *C. Leana* and some others, the stigmas are often two, instead of three, and the capsule 2-4-valved.

**CALYPTRIDIMUM QUADRI PETALUM.** Loosely branching from the base and prostrate, with broad spatulate leaves 1 to 3 inches long by 3 to 8 lines broad: racemes axillary and terminal, scorpioid and nearly naked: flowers nearly sessile and mostly imbricated, the round-reniform sepals conspicuously nerved and scariously margined, the longer 2 to 4 lines broad, exceeding the four oblong or round-ovate nearly equal petals: stigmas broad, nearly sessile: capsule oblong, 3 lines long, 12-20-seeded. — On the head-waters of Eel River in Lake County, California, Volney Rattan, June, 1884. It was also collected by Dr. Torrey in the same county in 1865, and referred in the Botany of California to *C. roseum*. It differs from the other species in the increased number of petals, and its broader sepals give it somewhat the appearance of *Spraguea*, which genus now rests only on its three exserted stamens and the elongated style.

**MALVASTRUM FOLIOSUM.** Stout, tall and erect, simple above and leafy to the summit, densely and coarsely stellate-pubescent throughout: leaves thick, broadly ovate, subcuneate at base, shortly or obscurely 5-lobed, the lobes acute and acutely dentate,  $1\frac{1}{2}$  to 2 inches long, on petioles a half-inch long; flowers nearly sessile in axillary nearly sessile panicles shorter than the leaves; bracts filiform: calyx 6 to 8 lines long, the lobes attenuate; petals purplish, little exceeding the calyx: carpels round-oblong, smooth, a line long. — Allied to *M. densiflorum*, more leafy above, more abundantly pubescent, the leaves not cordate at base, acutely lobed and toothed, the panicles somewhat less dense, and shortly peduncled. Found at Santo Thomas, on the coast of Lower California, by C. R. Orcutt, September, 1884.

**SIDA ALATA.** Erect, 3 to 6 feet high or more, branching, densely stellate-tomentose: leaves ovate to oblong-ovate, cordate at base, acute or obtusish, 1 to  $2\frac{1}{2}$  inches long, exceeding the petioles: pedicels slender, axillary, mostly solitary, exceeding the petioles, jointed above the middle: calyx-lobes acuminate; petals purplish, 5 lines long: carpels numerous, the small dark-colored triangular coriaceous body (1 line long) bicostate on the back, strongly reticulated on the sides, dehiscent at the summit and bearing two broad membranous crests 2 lines long: seed dark-colored. — A remarkable species on account of the early development of the upper portion of the valves of the carpels into free wing-like crests, in which respect it resembles *Cristaria*. But the

carpels do not separate from a persistent basal disk as in that genus, and there seems to be no good reason for excluding it from *Sida*. Collected by C. G. Pringle in Sonora, Mexico, about one hundred miles south of the boundary, in a low range of hills thirty miles from the Gulf.

**ABUTILON AURANTIACUM.** Woody at base, the herbaceous stems  $\frac{1}{2}$  to 2 feet high, pubescent and somewhat villous: leaves densely soft-tomentose, velvety and whitish, round-cordate, acute, the rounded basal lobes overlapping, unequally serrate,  $\frac{1}{2}$  to  $1\frac{1}{2}$  inches broad, shorter than the petioles: flowers axillary and solitary, on villous-pubescent pedicels, which are as long as the petioles and mostly jointed near the base or the lower above the middle: calyx-lobes broadly ovate, acute; corolla bright orange, 6 to 9 lines long: calyx and fruit villous-pubescent; carpels 10, abruptly short-beaked, 3-seeded, 4 lines long, about equalling the calyx. — On Todos Santos Bay, Lower California, by C. C. Parry, January, 1883, and at Tia Juana, by C. R. Orcutt, in May of the same year.

**ABUTILON PARISHII.** Stout, branching from the base, the herbaceous stem (2 feet high or more), branches, and petioles more or less villous with reflexed hairs and tomentose: leaves on slender elongated petioles, covered with a dense fine apparently not stellate pubescence, white or whitish beneath, darker above, cordate-ovate with a deep narrow sinus, acute or acutish, coarsely and unequally toothed, 1 or 2 inches long: pedicels axillary, short, 2 to 6 lines long in fruit, jointed above the middle: calyx thinly tomentose, green, 3 lines long, the lobes lanceolate; petals orange, 4 to 6 lines long: carpels thinly pubescent, somewhat villous along the dorsal suture, 4 lines long, with a divergent narrow beak a line long. — On the foothills near Lowell, Arizona, W. F. Parish, May, 1884, and in the Santa Catalina Mountains, C. G. Pringle, April, 1884. Near *A. Wrightii*, but stouter, the leaves on longer petioles and more coarsely toothed, the pedicels shorter, calyx much smaller and less tomentose, etc.

**ABUTILON LEMMONI.** Perennial, the stout half-woody branching stems 1 to 2 feet high, hoary throughout with a very dense short stellate pubescence, its stellate character scarcely perceptible on the calyx: leaves cordate to cordate-lanceolate, acute or slightly acuminate, dentate, the blade usually an inch or less (sometimes two inches) long, about equalling or shorter than the slender petioles, slightly greener above: peduncles axillary, solitary, shorter than the leaves, jointed near the top: calyx with broadly ovate acute lobes; corolla yellow or orange, small (3 to 4 lines long): carpels about 9, acute, 4 or 5 lines

long, finely pubescent, 3-seeded, equalling or a little exceeding the enlarged calyx. — On rocky hillsides near Santa Cruz, Sonora, Thurber (n. 943), 1851; Santa Catalina Mountains, Arizona, Lemmon (n. 130), 1881, and by Parish and Pringle, 1884; Northwestern Sonora, Pringle, 1884; Cedros Islands, Lower California, by Dr. T. H. Streets in 1876, and at Tia Juana, by Orcutt. Much resembling a species collected by Berlandier in Northeastern Mexico (n. 1550, 3050, and 3108; *A. Berlandieri*, Gray, in herb.), which, however, has more acuminate calyx-lobes, larger flowers, and more acuminate carpels with coarser stellate pubescence, the peduncles often several-flowered, and leaves usually more oblong and more acuminate.

**SAGERETIA WRIGHTII.** A shrub 2 to 5 feet high, with slender spreading pubescent branches and branchlets: leaves thin, bright green and shining on both sides, very sparsely villous on the midvein beneath, oblong or sometimes elliptical to lanceolate, acute or obtuse or sometimes emarginate, cuneate to subcordate at base, sparingly acutely serrulate, 4 to 8 lines or sometimes an inch long, with a short slender petiole: panicle very short (an inch long or less), often reduced to a short spike or even to a few flowers in the uppermost axils; sepals ovate, acute: fruit unknown. — Collected by Wright (n. 925) in 1851 at Santa Cruz, Sonora (referred to *S. Michauxii* in Pl. Wright. 2. 28, and in Hemsley, Bot. Biol. Cent.-Amer. 1. 200), by Dr. V. Havard at the Falls of Capote Creek, W. Texas, in October, 1883, and by C. G. Pringle on the foothills of the Santa Rita Mountains, Arizona, in July, 1884. *S. Michauxii*, of the Atlantic States, has smoother branches, more ovate and usually acuminate crenately toothed leaves, and more numerous flowers, with the calyx-lobes more lanceolate.

**RHUS (STYPHONIA) OVATA.** A shrub, 5 to 10 feet high, glabrous excepting the finely pubescent branches and the bracts of the inflorescence: leaves coriaceous and shining, ovate, acute or acuminate, entire or rarely sparingly toothed, 2 or 3 inches long, on a stout usually reddish petiole 4 to 8 lines long: flowers in dense closely paniced spikes a half-inch long or less, the rounded bracts and sepals purplish; petals light yellow: fruit compressed-ovate, 2 or 3 lines long, viscid-pubescent. — On hills and mountains, away from the coast, from San Diego to Los Angeles County, the Cantillas Mountains in Lower California, and in Southern Arizona; also on Santa Catalina Island (W. H. Lyon). It has been confounded with the coast species *R. integrifolia* (and figured for it by Torrey in Pac. R. Rep. 7. 9, t. 2, excepting the single leaf), which has smaller obtuse and more frequently serrate leaves with shorter petioles, more pubescent, and with twice longer

fruit (5 lines in diameter). The broad usually very dense panicles are an inch or two long.

**LUPINUS (PLATYCARPOS) ORCUTTII.** Diffusely much branched from the base, low (2 to 4 inches high), pubescent throughout with short stiffish spreading hairs: leaflets 5, oblong-spatulate, 3 to 6 lines long, shorter than the petioles: racemes numerous, sessile in the axils, 1 or 2 inches long, the scattered purple or reddish flowers 3 lines long: pod oblong, 4 lines long, 2-3-seeded: seeds a line in diameter. — Collected at Japa, in Lower California, near the boundary, by C. R. Orcutt, July, 1884. Allied to *L. pusillus*.

**HOSACKIA (SYRMATIMUM) NANA.** A dwarf prostrate very leafy and slender cespitose perennial, canescent throughout with short white spreading or subappressed hairs: leaflets 5 to 7, approximate, oblong-obovate, folded, a line long or less upon a slender petiole 1 or 2 lines long: peduncles shorter than the petioles, bearing 1 or 2 small flowers subtended by a small bract: calyx a line long, the teeth about half the length of the campanulate tube; corolla white or purplish, 2 or 3 lines long; ovary 1-ovuled. — On the mesa of Toyalani, near Zuñi, New Mexico; collected by Dr. W. Matthews, U. S. A., in 1883.

**DALEA ORCUTTII.** Perennial, with numerous short slender herbaceous subprocumbent or ascending stems (3 or 4 inches long) from a woody branching rootstock, appressed silky-puberulent: leaves 4 to 6 lines long, the folded oblong-obovate leaflets (4 to 6 pairs) 1 or 2 lines long, glabrous above: peduncles about equalling the leaves; spikes short ( $\frac{1}{2}$  inch long), somewhat crowded, the flowers reflexed or spreading: calyx short-villous, turbinate, the lanceolate acuminate teeth equalling or exceeding the tube; the purple orbicular banner and the wings scarcely exerted, the broad twice-longer keel purple on the inner margin. — At Topo and in the Cañon Cantillas, Lower California; collected by C. R. Orcutt, in October, 1882, and July, 1884. It was suspected that this might be the *D. canescens* of Bentham, collected at Magdalena Bay, but a comparison made by Prof. Oliver at Kew shows that, though allied to that species, it is not identical with it, the pubescence in *D. canescens* being of short somewhat sparse spreading hairs, and the calyx very small (1 line long).

**DALEA (XYLODALEA) MEGACARPA.** Shrubby, densely white-tomentose throughout and conspicuously glandular-punctate: leaflets 5 or 6 pairs, suborbicular, retuse,  $1\frac{1}{2}$  to 3 lines long: spikes rather dense, becoming 4 to 7 inches long; bracts narrowly linear, equalling the calyx: calyx turbinate-campanulate, with oblong obtuse teeth, shorter than the tube; petals yellow, becoming purplish brown, free and dis-

tinct, little exceeding the calyx (3 lines long), scarcely unguiculate: pod 4 lines long, 1-2-seeded: embryo green. — Collected by C. G. Pringle, April, 1884, in Northern Sonora, 150 miles south of the boundary, on the sandy beach at the mouth of a cañon opening out upon the Gulf of California, forming broad dense clumps two feet high. Distinguished from the other species of the group by the short bright yellow corolla. It is perhaps the "*Dalea* (?) *sp. n.*" of Benth. Bot. Sulph. 12, from the Bay of Magdalena, Lower California.

*DALEA RUBESCENS*, Watson (Proc. Amer. Acad. 17. 369). This species has been more recently collected in the mountains of Arizona by Lemmon and Pringle. Its stems are very rarely branched as they are in *D. aurea*, the leaflets (often pinnated) are narrower, the heads much stouter and denser, and the narrower bracts less conspicuous.

*BRONGNIARTIA MINUTIFOLIA*. A low shrub (1 to 3 feet high), much branched, the slender glaucous-green branchlets nearly glabrous: leaves 1 or 2 inches long, with slender rhachis, the herbaceous lanceolate stipules a line long; leaflets 10 to 20 pairs, linear, revolute, 1 or 1½ lines long: flowers solitary, on short naked peduncles (3 lines long); calyx 3 lines long, glabrous, persistent: pod glabrous, oblanceolate, 9 lines long, attenuate to a stipe about equalling the calyx-tube. — Found on the foothills south of the Chisos Mountains in Western Texas by Dr. V. Havard, U. S. A., in July, 1883.

*ASTRAGALUS CONGDONI*. Near *A. Andersoni*, more or less soft-pubescent, the decumbent stems about a foot long: leaflets 8 to 10 pairs, small and orbicular or obovate to oblong (1 to 4 lines long), retuse or obtuse: racemes open, on elongated peduncles: teeth of the campanulate calyx short and triangular; corolla pale yellow, 4 or 5 lines long: pod sessile, chartaceous, linear, curved, 2-celled by the intrusion of the dorsal suture, puberulent, nearly an inch long, somewhat compressed. — At Hite's Cove on the Merced River, Mariposa County, California, collected by J. W. Congdon, June, 1883. Distinguished from *A. Andersoni* by smaller and mostly broader leaves, less pubescence, shorter calyx-teeth, and a narrower less villous pod.

*ASTRAGALUS ACUTIROSTRIS*. Annual, slender, resembling *A. Nuttallianus*: leaflets 5 or 6 pairs, retuse, 2 or 3 lines long: racemes much exceeding the leaves in fruit: calyx a line long, the slender teeth about equalling the turbinate tube; corolla whitish, 2 lines long, the keel with an acute often ascending beak: pods (1 to 5) scattered on the rhachis, like those of *A. Nuttallianus*, but the ventral suture nearly straight, 8 lines long. — Near Brown's Ranch, Mohave Desert, by Parish Brothers, May, 1882, and on dry rocks above the Calico Mines,

near Fort Mohave, by J. G. Lemmon, May, 1884. Closely allied to *A. nothoxys*, Gray, but with much smaller flowers and calyx.

**ASTRAGALUS ORCUTTIANUS.** Stems numerous, slender, decumbent, a foot long, sparingly strigose-pubescent: leaflets 8 to 10 pairs, rounded, 1 to 3 lines broad: peduncles shorter than the leaves, 2 or 3 inches long in fruit; raceme loose, few-flowered: calyx campanulate, 2 lines long, the teeth mostly equalling the tube: pod linear-falcate, ascending, coriaceous, attenuate to a stipe shorter than the calyx, with a dorsal groove and acute ventral suture, 2-celled by the intrusion of the dorsal suture, 9 lines long. — Allied to *A. arizonicus*, rather peculiar in habit, the small round leaflets upon an elongated rhachis exceeding the racemes. In Cantillas Cañon ("Tantillas" of Palmer), Lower California, by C. R. Orcutt, August, 1883.

**ASTRAGALUS PROCUMBENS.** Biennial or perennial, with numerous short procumbent and matted stems, canescent throughout with a short closely appressed straight pubescence: leaflets 2 to 6 pairs, oblanceolate to oblong-obovate or -oval, 2 to 5 lines long: peduncles usually exceeding the leaves, bearing a short few-flowered raceme: flowers spreading or reflexed; calyx campanulate, with narrow teeth several times shorter than the tube; corolla twice longer (about 3 lines long), yellowish to deep purple: pod sessile, thick-coriaceous, 1-celled, turgid with prominent ventral suture, and at length deeply impressed dorsal one, oblong, spreading, 6 to 8 lines long. — Near Fort Wingate, New Mexico, by Dr. W. Matthews, U. S. A., in 1882 and 1883, and near the Indian village of Laguna, Lemmon, 1884. Also previously collected by Dr. Palmer, but locality uncertain. Nearly allied to *A. humistratus*.

**ASTRAGALUS MOHAVENSIS.** Biennial, hoary throughout with short white strigose pubescence, the branching stems a foot long or less: leaves rather long-petiolate, the leaflets 2 to 4 pairs, obovate to oblong-obovate, 3 or 4 lines long, obtuse: raceme little exceeding the leaves, few-flowered: calyx turbinate, nearly 2 lines long, the slender teeth about equalling the tube; corolla 3 lines long, purplish: pod sessile, coriaceous, narrowly oblong, obcordate in cross-section, the ventral suture slightly curved and very prominent, more or less sulcate on the back and 2-celled by the intrusion of the dorsal suture, 8 to 11 lines long, acute. — In a cañon south of Newberry Spring in the Mohave Valley, in large depressed masses, by Mr. and Mrs. J. G. Lemmon, May, 1884. Allied to the last and to *A. humistratus*.

**ASTRAGALUS CASTANEÆFORMIS.** Biennial or perennial (?), densely cespitose, with numerous branching prostrate and decumbent stems

2 to 4 inches long: leaflets 4 to 8 pairs, oblong-obovate, 3 or 4 lines long, appressed silky-pubescent, acute or obtuse: peduncles equalling or exceeding the leaves (2 or 3 inches long); racemes short, loose; flowers ascending: calyx tubular, 4 lines long, with short slender teeth; corolla purplish, twice longer: pod coriaceous, ovate with a rounded base, more or less depressed when mature and somewhat sulcate on the ventral side, 1-celled, sessile, 6 to 9 lines long and 4 to 6 broad, silky-pubescent. — Near Williams' Station, Arizona, by Mr. and Mrs. J. G. Lemmon, July, 1884. Of the *Scytocarp*i group; the shape of the pod nearly that of our native chestnut, though it is somewhat smaller.

**ASTRAGALUS TROGLODYTUS.** Biennial or perennial (?), the rootstock bearing several crowded stems an inch long or less: leaves long-petioled, 4 inches long; leaflets 6 to 8 pairs, oblong-obovate, 4 or 5 lines long, acute or obtuse, strigose-pubescent: scape-like peduncles much exceeding the leaves (6 to 8 inches long); racemes short, dense; bracts persistent (2 or 3 lines long) and reflexed: flowers small; calyx campanulate, 2 lines long, the slender teeth half the length of the tube; corolla twice longer: pod subglobose, coriaceous, sessile, 1-celled, scarcely exceeding the calyx (2 or 3 lines long), silky-pubescent, 2-6-seeded. — In the San Francisco Mountains, Arizona, near "Cliff-dwellers' Ravine," Mr. and Mrs. J. G. Lemmon, August, 1884. A species of the *Scytocarp*i group, strongly marked by its scapose habit in connection with its small flowers and very peculiar pod.

**ASTRAGALUS FALLAX.** Perennial, with slender decumbent flexuous stems a foot long or more, canescently pubescent: leaves sessile, short; leaflets about 8 pairs, oblong to obovate, 2 to 6 lines long, obtuse or retuse: peduncles much exceeding the leaves; raceme loose; flowers reflexed: calyx campanulate,  $2\frac{1}{2}$  to 3 lines long, with very short teeth; corolla purplish, half an inch long: pod very shortly stipitate, subcoriaceous, oblong-ovate, turgid, somewhat depressed and sulcate when mature, acute at each end, 1-celled without intrusion of the sutures, 8 to 11 lines long including the stipe, and 3 or 4 lines broad, spreading or deflexed. — In Western New Mexico, collected by Wright (n. 1004) and by Sitgreaves, and at Flagstaff near the San Francisco Mountains, Arizona, by Rusby, and also by Lemmon. It has long been confused with *A. Fendleri*, and Wright's specimens were made the basis of the revised description of that species in Pl. Wright. 2. 24, which has been mainly followed in later works. The real *A. FENDLERI*, collected by Fendler, Parry, and Rothrock, in New Mexico and Colorado, has less pubescence, narrower leaflets, somewhat smaller



flowers and narrower calyx, and a much narrower pod attenuate to the base but not stipitate. *A. GRACILENTUS* is very similar to *A. Fendleri*, but the broader and shorter pod is not attenuate below, and is strictly sessile. *A. GREENEI*, Gray, is another nearly related species, having a shorter and more pubescent calyx (2 lines long) and shorter corolla, and the somewhat shorter pod strictly sessile.

*DESMODIUM ARIZONICUM*. Perennial, the herbaceous stems erect, 3 feet high or more, more or less coarsely pubescent; branches slender, elongated: leaves nearly sessile, 3-foliate; stipules linear-lanceolate, acuminate; leaflets linear-oblong (the lower narrowly oblong), obtuse or acutish, strigose above, more loosely hairy beneath, 1 to 2½ inches long: flowers small (2 or 3 lines long), on filiform spreading pedicels (½ inch long) in elongated racemes: pod slightly pubescent, the joints suborbicular.—Collected by J. G. Lemmon in Arizona in 1881 (n. 540), and in the Santa Rita Mountains by C. G. Pringle, 1884. Closely allied to *D. sessifolium* and *D. Hartwegianum*, differing from the first in its greater pubescence, less acute leaflets, longer racemes and pedicels, and less pubescent pods,—from the latter in its narrower leaflets, branching inflorescence, much smaller flowers, etc.

*LATHYRUS CALIFORNICUS*. Stem stout, tall and more or less winged: stipules semi-sagittate, dilated and often coarsely toothed, or the upper narrower; leaflets 3 to 7 pairs, ovate-oblong to linear-lanceolate, ½ to 2 inches long or more, acute or acuminate, softly pubescent on both sides, as also the rhachis: peduncles stout, nearly equalling the leaves, many-flowered: calyx-teeth short (the lower 2 lines long or less); petals 7 to 9 lines long, apparently yellowish or pinkish: pod linear, 2 inches long by 3 lines broad, attenuate at base to a stipe.—Along creek-banks in the valleys and foothills of California; referred doubtfully in the Botany of California (as by Dr. Torrey) to *L. venosus*, as var. *Californicus*. That eastern species, which reaches the Saskatchewan region and Lake Winnipeg, does not appear west of the Rocky Mountains. It has broad obtuse or retuse (rarely acute) leaflets, narrower stipules, smaller purple flowers, and the pods less attenuate at base.

*LATHYRUS BOLANDERI*. Stems usually stout and tall, wingless; glabrous throughout or the calyx only ciliate: stipules dilated, semi-sagittate, often toothed; leaflets 3 to 5 pairs, oblong-lanceolate to broadly ovate, obtuse or retuse or acute, ½ to 1½ or 2 inches long: racemes about equalling the leaves, 8–10-flowered: calyx-teeth broad, the lowest elongated; petals purple, 6 to 9 lines long: pods linear,

attenuated to the base, 2 to  $2\frac{1}{2}$  inches long, 3 or 4 lines broad. — In thickets, Oakland Hills, Bolander and Dr. Torrey in 1865; Angel Island, G. R. Vasey, 1876; Del Norte County, T. J. Howell, 1884; Butte County, Mrs. John Bidwell, a very broad-leaved form; Union County, Oregon, W. C. Cusick. This species has been confounded with the last, but may be distinguished by the want of pubescence, the less narrow and often obtuse leaves, the longer calyx-teeth, and purple flowers.

*CALLIANDRA SCHOTTII*, Torrey in herb. This species, which is doubtfully referred in the Botany of the Mexican Boundary to *C. Portoricensis*, has been again collected by Mr. Pringle in the Santa Catalina Mountains, Arizona, but still without fruit. The specimens are finely pubescent throughout, branches elongated, the leaflets 4 to 7 pairs, acutish, 2 or 3 lines long, and stipulates subulate,  $1\frac{1}{2}$  lines long; otherwise as described by Dr. Torrey.

*COWANIA HAVARDI*. A much-branched shrub, 2 or 3 feet high, with rough grayish brown bark: leaves distichously fascicled at the ends of the numerous very short branchlets, entire, revolute-terete, white-tomentose below, glabrous above, spinulose-apiculate, 2 or 3 lines long: flowers solitary on the branchlets, shortly pedicellate; calyx-tube glandular-hispid, the short lobes oblong-ovate; petals white or yellowish, 3 or 4 lines long: carpels 8, with the plumose tails an inch long or less. — On a rocky mountain west of Tornillo Creek, W. Texas, by Dr. V. Havard, U. S. A., August, 1883, in flower and fruit.

*HORKELIA SERICATA*. Perennial, cespitose, not glandular: radical leaves densely white-silky, the numerous crowded leaflets 2 or 3 lines long, oblong or obovate, unequally bifid: flowering stems slender, a foot high, the few short leaves with linear entire or bifid leaflets; cymes open and few-flowered: calyx silky, with narrowly lanceolate acuminate lobes, the narrower appendages nearly as long; petals narrowly obcordate, white tinged with pink: stamens 10, subulate, short: carpels 5; styles filiform: receptacle somewhat villous. — On the summit of the Coast Range in Curry County, Southwestern Oregon, by Thomas Howell, June, 1884.

*IVESIA PINNATIFIDA*. Caudex thick, with very short stout branches: leaves pinnate, villous, the leaflets ( $\frac{1}{2}$  to 1 inch long) deeply pinnatifid and segments linear: stems sparingly leafy, bearing an open panicle, 6 inches high; flowers solitary, on pedicels nearly a half-inch long: calyx-lobes lanceolate, the accessory lobes slightly narrower and shorter: stamens 20: carpels numerous. — Abundant in meadows

near Flagstaff, Arizona, by Mr. and Mrs. J. G. Lemmon, September, 1884, in fruit.

**IVESIA LEMMONI.** Branches of the caudex rather slender: leaves silky-villous, the leaflets (3 to 5 pairs) linear-oblong, tridentate at the apex, about an inch long: flowering stems slender, a foot high, bearing one or two small leaves, the panicle very loose and spreading, sparingly pubescent; flowers solitary on slender pedicels: calyx-lobes lanceolate, acuminate, twice longer than the linear appendages; petals yellow, obovate, little exceeding the calyx: stamens 15: carpels 3 to 5; receptacle very villous. — On vertical rocks bordering Oak Creek, near Flagstaff, Arizona, collected by Mr. and Mrs. J. G. Lemmon, August, 1884. Resembling *Horkelia tridentata* in its tridentate (though narrower) leaflets, but a true *Ivesia*, and differing from that species also in its open panicle, more attenuate sepals, yellow petals, and more numerous stamens. Only a few plants were found.

**HEUCHERA RACEMOSA.** Glandular-hispid: leaves reniform-cordate, crenately lobed and toothed, 1 or 2 inches broad: flowering stems 4 to 10 inches high, bearing 2 or 3 petiolate leaves and a loose few (6–15-) flowered raceme; pedicels short (a line long or less): calyx very broadly campanulate, 2 (becoming 3) inches long, acutely lobed; petals glandular, linear, entire and acuminate or more or less laciniately toothed toward the top, a little exceeding the calyx-lobes: stamens 5, very short, opposite to the calyx-lobes: styles very short; capsule subglobose, very shortly beaked: seeds very numerous, brownish, with wrinkled testa, not muricate. — On cliffs of Mount Adams, Washington Territory, at 7–8,000 feet altitude, by W. N. Saksdorf, July, 1883. With the habit of *H. Hallii*, but the stem leafy and the inflorescence more strictly racemose, and peculiar in its frequently toothed petals.

**SEDUM STELLIFORME.** Branching from a stout fleshy base, with fleshy-fibrous roots; stems 2 to 4 inches high, leafy, simple or branched: leaves lanceolate to linear, 2 to 4 lines long, scattered: branches of the inflorescence (2 or 3)  $\frac{1}{2}$  to 1 inch long; pedicels very short: petals white tinged with purple, 2 or 3 lines long, equalling the stamens, twice longer than the lanceolate sepals: mature carpels divaricately divergent, usually lined with purple, 2 lines long. — In the Huachuca Mountains, Southern Arizona (2702 Lemmon, 1882), and near Fort Wingate, New Mexico, by Dr. W. Matthews, U. S. A., in 1883.

**CUPHEA GLUTINOSA,** Cham. & Schlecht. A slender glandular-pubescent perennial, with decumbent or ascending stems a span high:

leaves lanceolate (or the lower ovate-lanceolate), acute, sessile or very shortly petiolate, 3 to 6 lines long: flowers alternate, the very short pedicels lateral, with a pair of minute bractlets near the middle: calyx 3 or 4 lines long, with a very short broad spur; teeth nearly equal, and tube pubescent within; petals purple, 3 lines long; stamens 11, nearly or quite equalling the tube: capsule gibbous, 2 lines long, about 10-seeded: seeds nearly a line broad, with a narrow thick margin. — Specimens, thus referred by Koehne, have been collected by Mr. A. B. Langlois in low grassy places along Vermillion Bayou, near Vermillionville, Western Louisiana, April, 1884. The species is otherwise known only from S. America (S. Brazil and Buenos Ayres to Bolivia), but the evidence is all in favor of its being indigenous where it was found in Louisiana. Koehne, in his monograph of the *Lythraceæ* (Engler's Botanische Jahrbücher, 2. 148), describes the seeds of this species as having a thin narrow wing, a character which he uses in forming his groups. In a recent letter he admits that he has found this character inconstant, and of little value even for distinguishing species. The above description is drawn from Louisiana specimens.

**CENOTHERA HAVARDI.** Perennial, with branching caudex and numerous short slender simple or branching stems, canescent with short close pubescence: leaves linear-lanceolate, attenuate at each end, irregularly sinuate-pinnatifid,  $\frac{1}{2}$  to 2 inches long: flowers axillary, sessile, erect in the bud, puberulent; calyx-tube  $1\frac{1}{2}$  to 2 inches long, slightly dilated above, the attenuate tips of the lobes coherent; petals orange-yellow turning red, oblong-lanceolate, acute, a half to one inch long: stigmas short (1 or 2 lines long): capsule oblong-ovate, 4-angled and the valves strongly ribbed, about 5 lines long. — Collected on prairies near Morfa, Western Texas, by Dr. V. Havard, U. S. A., July, 1883. Scanty specimens were also collected by Mr. Wright in 1851 in a prairie-dog town near Leon Springs. A peculiar species of the *Eucnothera* section, not falling readily into any of the recognized groups, but perhaps most nearly related to *C. canescens*.

**HAUYA CALIFORNICA.** Shrubby, erect (6 to 8 feet high), the slender branches grayish: leaves somewhat fascicled, narrowly oblong-lanceolate, acute, 3 to 6 lines long, canescently puberulent: flowers in terminal racemes with small leafy bracts, shortly pedicellate, bright scarlet; calyx-tube cylindrical, 8 to 12 lines long, the lanceolate lobes equalling the obovate petals (3 lines long): stamens in two unequal series, the outer equalling the petals; anthers scarcely apiculate: stigma discoid: capsule narrowly oblong, 6 to 9 lines long, long-persistent. — On Cedros Island, Lower California; collected by Dr.

John A. Veatch in 1859, and again by L. Belding in 1881. It was described by Dr. Kellogg from Veatch's specimens as *Enothera arboorea* (Proc. Calif. Acad. 2. 32), and figured by him under that name in the "Hesperian." The seeds are described by him as "appendiculate"; the well-developed ovules are conspicuously winged at the upper end. It is a strongly marked species in this Mexican and Guatemalan genus, the three other species of which are described and figured by Hemsley, in Biol. Cent.-Amer., Bot. 1. 462, t. 29.

MENTZELIA (BARTONIA) BRANDEGEI. Stem branching, a foot high: leaves linear, pinnatifid with narrow lobes, 1 to 3 inches long; the bracts on the short pedicels mostly entire, very narrow: flowers in open corymbs: calyx-lobes 6 to 8 lines long, the five narrowly oblanceolate petals an inch long or more: stamens about 30, a little shorter, none petaloid: capsule narrowly oblong (7 to 9 lines long by nearly 3 lines wide): seeds horizontal, flattened, with somewhat angular or rugose sides and narrow scarcely winged margin.—Near the Simcoe Mountains, Washington Territory, on the mesa bordering Satas Creek; collected by T. S. Brandegee in 1883. Allied to *M. Wrightii*, *M. pumila*, etc.

MENTZELIA (BICUSPIDARIA) INVOLUCRATA. Annual, branching from the base, stout, a foot high or less, white-caulescent: leaves coarsely sinuate-dentate, linear- to oblong-lanceolate, the lower attenuate to a short petiole, the rest sessile and mostly cordate-amplexicaul at base: flowers terminal, solitary and sessile, involucrate with a pair of very broadly ovate acute or acuminate scarious bracts, the green margin coarsely toothed: petals pale yellow, an inch long, oblanceolate and cuspidately acuminate; stamens very numerous and slender, 3 to 6 lines long, the outer dilated above and continued into a long linear cusp on each side of the anther: style tubular, equalling the longer stamens, with three flattened stigmatic lobes at the summit: capsule about 9 lines long by 3 or 4 broad at the top, dehiscent by three apical valves: seeds in one row on each thin placenta, horizontally flattened but not margined, irregularly rugose and very minutely and densely tuberculate.—In San Bernardino County, California, by C. C. Parry in 1876; near Wickenburg, Arizona, by Dr. E. Palmer (n. 598 of his 1876 collection, distributed as *M. tricuspis*), and at Yucca, by M. E. Jones; and in Northwestern Sonora, by C. G. Pringle in 1884. Resembling *M. tricuspis* and *M. hirsutissima*, with which it forms a section (*Bicuspidaria*), distinguished especially by the bicuspidate outer filaments, etc., as has already been indicated under the latter species in Proc. Amer. Acad. 12. 252.

**CEREUS (LEPIDOCEREUS) PRINGLEI.** Stems erect, irregularly branching above the base, and the branches also often divided, very stout and reaching a height of 20 or 30 feet or more, jointed; ribs usually 13, very rarely more; areolæ contiguous upon the ribs, oblong or lanceolate, the younger densely tomentose and with an outer circle of nearly erect more or less unequal ash-colored spines (mostly 6 to 9 lines long) and a central stouter one twice longer, all terete; the older areolæ naked, with about 15 dark flattened spines, mostly widely spreading, about an inch long, and deciduous: flowers lateral and scattered below the summit of the stem,  $2\frac{1}{2}$  inches long, the ovary and tube very densely covered with tawny hairs nearly or quite concealing the lanceolate scales and outer sepals; petals spatulate, white tinged with green or purple, 6 lines long: fruit globose, 2 inches long, bearing the persistent flower and densely covered with globose cushions (4 or 5 lines in diameter) of dense tomentum intermixed with more or less numerous white bristly spines ( $\frac{1}{2}$  inch long or less): seeds black and shining, obliquely oblong-ovate,  $1\frac{1}{2}$  lines long; hilum oblong, basilar.—This very interesting addition to the *C. giganteus* group was found by Mr. C. G. Pringle scattered over the hills and mesas south of the Altar River in Northwestern Sonora, within 75 miles of the boundary. It is of more ponderous habit than *C. giganteus*, and scarcely equalling it in height, with numerous branches starting within two or three feet of the ground. The number of ribs is fewer than in that species, and the flowers are not borne clustered at the summit, but scattered along the ribs for two or three feet below the top. The grooves are about two inches deep, and the ribs upon all the older portions of the branches have usually become quite thornless. The fruit (only remains have been collected) seems to burst irregularly at one side, or perhaps is altogether indehiscent.

**CARUM OREGANUM.** With the habit of *C. Gairdneri*; lower leaves more divided, with shorter linear lobes: fruit oblong,  $1\frac{1}{2}$  lines long or more.—On “Wappatoo Island,” Oregon, by Nuttall (*Edosmia Oregana*, in herb.); E. Hall (n. 203); Union County, Oregon, by W. C. Cusick; East Humboldt Mountains, Nevada, by Watson (n. 442, in part) in 1868. The fruit of the more widely distributed *C. Gairdneri* is ovate and shorter, a line long or but little more. Both are perennial, perpetuating a series of tubers for several years.

**CYOPTERUS BIPINNATUS.** Cespitose, the short branches of the rootstock covered with the crowded remains of dead leaves, glaucous, rough-puberulent: leaves pinnate with 4 or 5 pairs of short (3 to 5 lines long or less) subequal leaflets, which are pinnately divided, the

segments linear and entire or cleft into short linear lobes; scape slender, 4 to 6 inches high, much exceeding the leaves; rays of the umbel short (1 to 4 lines); involucels of several linear-lanceolate bracts: flowers white: fruit nearly sessile,  $1\frac{1}{2}$  or 2 lines long; the wings thin, but somewhat corky, narrow; vittæ 3 or 4 in the rather broad intervals. — In the Rocky Mountains south of Virginia City, Montana, by Prof. Hayden in 1871 (*C. fœniculaceus*); on a ridge above Bannock City, S. W. Montana, Watson in 1880, and on Mount Helena, Montana, W. M. Canby in 1883. Resembling *C. alpinus*, which is glabrous and more dwarf, the scape scarcely exceeding the leaves, and the fruit with very thick corky wings.

**PEUCEDANUM SUKSDORFII.** Very stout and tall (2 to 3 feet high or more), glabrous: leaves very large, decompose, the segments linear, 1 or 2 inches long, entire or mostly 2-3-cleft toward the top: rays  $2\frac{1}{2}$  to 5 inches long: involucels of numerous (6 to 12) linear acuminate bracts: flowers yellow: fruit narrowly oblong, 9 to 14 lines long by 3 to 6 broad, prominently ribbed, the large vittæ filling the intervals. — On dry rocky mountain-sides, W. Klickitat County, Washington Territory; collected by W. N. Suksdorf, June and July, 1883. Very remarkable among western species for the size of all its parts.

**PEUCEDANUM HOWELLII.** Acaulescent, glabrous: radical leaves biternate to biquinate, the leaflets cuneate-orbicular to round-cordate, acutely dentate, often 3-lobed, 6 to 12 lines long: scape 12 to 18 inches high: the fertile rays of the umbel few, elongated and divaricate; bracts of the involucre green, stout, acuminate-lanceolate: calyx of sterile flowers prominently toothed: fruiting pedicels few, 4 lines long: fruit broadly elliptical or nearly orbicular, 4 lines long; vittæ 3 or 4 in the intervals and 4 to 6 on the commissure. — Collected near Waldo, Josephine County, Oregon, by Thomas Howell, June, 1884. Of the *P. Euriptera* group.

**ANGELICA DAWSONI.** Rather slender, 1 to 3 feet high, glabrous or, nearly so; stem simple: radical leaves biternate, the lanceolate leaflets 1 or 2 inches long, sharply and finely serrate, acute or acuminate, the terminal one sometimes deeply 3-cleft; cauline leaves (1 or 2 or none) similar: umbel solitary, conspicuously involucre with numerous foliaceous lacerately toothed bracts nearly equalling the rays; involucels similar: rays short (about an inch long): fruit glabrous,  $2\frac{1}{2}$  lines long; vittæ solitary in the intervals. — Collected by Dr. Lyall in 1861 in the Rocky Mountains near the boundary, at 6,500 feet altitude, and on the slopes of the North Kootanie Pass by Dr. G. M. Dawson of the Canadian Geological Survey in 1883.

**BOERHAAVIA BRACTEOSA.** Near *B. spicata*: annual, glandular-pubescent and viscid, two feet high, leafy below: leaves ovate-lanceolate to lanceolate, undulate, acute or acutish, subcordate at base, 1 to 1½ inches long besides the petiole: flowers spicate on the slender branches of the panicle; bracts conspicuous, pink, oblong-lanceolate, acuminate, 1½ lines long, persisting as long as the fruit or longer: perianth small (a line long): stamens 3: fruit oblong-obovate, obtuse, rather acutely 4-5-costate, the intervals somewhat pitted, a line long. — In the Great Cañon of the Rio Grande, Western Texas, by Dr. V. Havard, September, 1883. Distinguished from *B. spicata* by its more viscid pubescence, longer and more persistent colored bracts, and the broader fruit more acutely costate.

**ATRIPLEX JULACEA.** Perennial, the slender woody stems procumbent, and the numerous short slender branchlets ament-like from the crowding of the close leafy undeveloped buds, scurfy-pubescent: leaves small, ovate-triangular, sagittate and clasping, thick, the larger cauline 2 lines long, those upon the branchlets scarcely a half-line long and sulcate from the folding back of the margins: fruit mostly solitary in the axils, 2 or 2½ lines long, the ovate marginless rigid bracts united to above the middle, and densely covered with irregular corky appendages. — Collected by C. R. Orcutt at Todos Santos Bay, Lower California, September, 1884. Related to *A. polycarpa*.

**ERIOGONUM (EUERIOGONUM) SUFFRUTICOSUM.** Perennial, very much branched and woody, low (4 to 6 inches high), canescent: leaves finely silky-tomentose both sides, fascicled and more or less revolute, oblanceolate, acute, attenuate to a short petiole, 2 to 4 lines long: peduncles simple or sparingly dichotomous, an inch long or less, bracteate, the bracts small and foliaceous, linear; involucre herbaceous, solitary, turbinate-campanulate, 6-cleft to below the middle, the lobes erect: flowers few, small (a line long), glabrous, pinkish, the outer segments of the perianth round-reniform, at length reflexed, the inner oblanceolate, obtuse, erect. — On the foothills of the Bofecillos Mountains, Western Texas; collected by Dr. V. Havard, September, 1883. A peculiar species, most nearly allied to some species of the *Umbellata* group, as *E. thymoides* and *E. sphærocephalum*.

**ERIOGONUM VAGANS.** (*Oxytheca inermis*, Watson, Proc. Amer. Acad. 12. 273.) Very near *E. hirtiflorum*, Gray, but less diffusely and finely branched, the branches more decumbent, and the flowers and akenes two or three times larger (half a line long). Both have similar ciliate leaves, unilateral foliaceous bracts, glandular pubescence, villous flowers, and obtusely triangular akenes. — In the San Ber-



nardino Mountains (W. G. Wright and S. B. Parish), and Mohave Desert (Mrs. K. Curran). The original locality is uncertain. *E. hirtiflorum* is more northern, ranging from Tuolumne to Lake and Colusa Counties. This species was at first upon a young and very insufficient specimen referred to *Oxytheca*, which genus appears to be clearly separated from *Eriogonum* only by the awned lobes of the involucre.

**ERIOGONUM (OREGONIUM) GIGANTEUM.** Of the *Corymbosa* section: a stout and tall shrubby perennial, bearing its leaves at the ends of the branches, which are tomentose or glabrate: leaves oblong, truncate or subcuneate at base, obtuse, 2 to 4 inches long including the stout petiole, pinnately nerved, densely tomentose, white and reticulately veined beneath, greener above: peduncle stout, bearing a broad dense dichotomously branched tomentose cyme, the foliaceous bracts lanceolate to linear: involucre sessile (the alar pedicellate), narrowly campanulate, densely tomentose, nearly a line long, cleft to the middle, the teeth lanceolate and acute; flowers small, tomentose, whitish, the oblong lobes green-nerved. — Found on the northwest coast of Santa Catalina Island, California, on rocky bluffs overhanging the sea, by W. S. Lyon, July, 1884. It is described as from 5 to 10 feet high and as much in diameter, the main stem sometimes 4 or 5 inches in thickness a foot above the ground, with thin fibrous bark and the cymes often 18 inches broad. It is allied to *E. corymbosum*, and especially to *E. arborescens*, Greene, which has linear sessile leaves and a broader involucre with broader and shorter teeth.

**ERIOGONUM (OREGONIUM) ORCUTTIANUM.** Of the *E. Heermannii* group: the very short herbaceous leafy stems from a woody base, and the rigid divaricate branches finely subtomentose-pubescent: leaves scattered, thick, nearly glabrous, broadly ovate or obovate, obtuse, shortly petiolate, 3 to 8 lines long; bracts ternate, deltoid-subulate, small, subherbaceous: involucre solitary, turbinate-campanulate, subtomentose, nearly a line long: flowers tomentose, greenish white,  $\frac{2}{3}$  of a line long, the oblong-obovate lobes of the perianth nearly equal. — In the Cantillas Mountains ("Tantillas" of Palmer), Lower California; collected by C. R. Orcutt, August, 1883: the specimens scarcely 6 inches high.

**ERIOGONUM (OREGONIUM) FOLIOSUM.** Of the *E. vimineum* group: annual, branching from the base, floccose-tomentose, the branches sparse and spreading: leaves ovate, cordate or cuneate at base, obtuse or acute, undulate, tomentose beneath, 3 to 9 lines long besides the petiole, radical, and in the axils of the subulate bracts: involucre broadly turbinate, cleft nearly to the middle, green, a line long: flowers

half a line long, the segments white or pinkish with a green midvein. — In the Cantillas Mountains, Lower California, by Dr. E. Palmer (n. 348 of 1875, distributed as *E. gracile*, var.?), and in the same region by C. R. Orcutt in 1882, and again in 1883. Differing from tomentose forms of *E. Baileyi* in its stouter leafy and less diffusely branched habit, more ovate undulate leaves, broader involucre, etc.

ARISTOLOCHIA (EINOMEIA) SUBCLAUSA. Stems low and slender (10 to 15 inches high), numerous from an elongated thickened root, sulcate, nearly glabrous: leaves cordate-ovate with a broad sinus, obtuse or acutish, 3-nerved, short-pubescent, about an inch long, the slender petiole 4 lines long: flowers axillary, solitary, upon a short pedicel (2 to 4 lines long), with a sessile ovate bract (3 lines long) at the base of the pubescent 5-sulcate linear ovary (3 or 4 lines long): calyx pubescent, 1 to 1½ inches long, nearly straight or subfalcate, the narrow lamina continuous with the tube (each 6 to 8 lines long), and the somewhat dilated base of the tube partially closed at the throat by a firm smooth reflexed circular diaphragm: stamens 5. — Collected at Tarandacuao in the State of Guanajuato, Mexico; received from Professor A. Dugés, August, 1884. The root, which has about the thickness of a finger, is used as a specific against cholera.

EUPHORBIA (ANISOPHYLLUM) RATTANI. Annual, prostrate, pubescent throughout: leaves obliquely ovate, cordate at base, acutish, entire, very shortly petiolate, 2 to 4 lines long: involucre solitary, shortly pedicellate, campanulate, a line long; glands small, equal, rounded and cup-shaped, yellowish, with a narrow white appendage: capsule pubescent, a line long: seed quadrangular, irregularly rugose or nearly smooth. — Found on Stony Creek, Colusa County, California, by V. Rattan, June, 1884. Of the *Chamaesyce* group, and somewhat resembling tomentose forms of *E. polycarpa*, but strictly annual.

#### TETRACOCCUS, Engelm. Mss.

Flowers diceious, apetalous. Staminate flowers: sepals 6 or 7, imbricate; stamens as many, in one series, surrounding a central lobulated disk; filaments free, becoming elongated; anthers extrorse, erect, the cells longitudinally dehiscent. Pistillate flowers: sepals 6 or 7, unequal(?); disk 4-lobed(?); ovary 4-celled, the cells 2-ovuled; styles 4, slightly united at base, linear, undivided, spreading. Capsule 4-lobed, the 2-valved cocci separating from a stout 4-angled columella. Seeds strophiolate; albumen fleshy; embryo straight, the cotyledons broad and flat. — A shrub, with mostly opposite entire linear and

nearly nerveless leaves. Flowers small, solitary in the axils, or the axillary peduncles 1-2-flowered.

**T. ENGELMANNI.** A much branched shrub, with smooth gray bark, glabrous throughout: leaves mostly opposite or approximately so, sometimes scattered or verticillate in threes, linear, acutish, nerveless excepting the rather obscure midvein,  $\frac{1}{2}$  to 1 inch long, on a very short slender petiole: staminate inflorescence shorter than the leaves, the slender small-bracteate peduncles usually 2-flowered, reddish; calyx half a line broad, the slender reddish filaments becoming 2 lines long: pistillate flowers solitary, the stout naked pedicel 3 or 4 lines long in fruit; one or two sepals usually persistent at base of the fruit, 2 lines long: capsule 3 lines in diameter: seeds usually solitary, smooth and shining. — Collected at St. Thomas, Lower California, by Parry, in February, 1883, with immature fruit, and by C. R. Orcutt in September, 1884, with staminate flowers and mature fruit. Specimens from the first collection of this plant were sent to Dr. Engelmann, and probably his last botanical work was in their examination. His notes and sketches have not been accessible to me, but the genus is evidently a new one, of the Euphorbiaceous tribe *Phyllanthææ*, and is not nearly allied to any other of the North American flora.

**ACALYPHA PRINGLEI.** Suffrutescent at base, with elongated slender decumbent branches, glandular-pubescent throughout: leaves broadly ovate, or often cordate with a broad shallow sinus, subcrenately dentate, the blade 9 to 18 lines long, somewhat longer than the petiole: male spikes cylindrical, slender, axillary, with occasionally one or two female flowers on the peduncle, or very rarely at the apex; female spikes terminal and axillary, short and few-flowered and shortly pedunculate: bracts 1-flowered, reniform, with 7 to 11 nearly equal short acutish teeth: stigmas 2 lines long, pinnately divided. — Northern Sonora, C. G. Pringle, 1884. It much resembles 34 Schaffner (*A. vagans*, var. *glandulosa*, Muell.), and 824 of Parry & Palmer (*A. mollis*, HBK., fide Hemsley, but not according to the characters given to that species), both from near San Luis Potosi, and both numbers including two perhaps distinct forms. Their more evident differences from the present species are found in the ovate-cordate leaves with a very narrow sinus, the conspicuously gland-tipped hairs of the pubescence, and the fewer teeth of the bracts. Other differences are found in the flowers, etc. A straggling shrub, 2 or 3 feet high, found on the shore of the Gulf of California, 150 miles south of the boundary.

**CROTON PRINGLEI.** A woody perennial, 3 to 6 feet high, with slender branches canescent when young; pubescence stellate: leaves

thin, pinnately nerved, nearly glabrous above, somewhat pubescent beneath, especially on the nerves, ovate to oblong-ovate, acuminate or acute, an inch or two long including the short slender petiole, or sometimes smaller, not glandular at base; stipules obsolete: racemes terminal, unisexual, few-flowered: calyx nearly glabrous, of the pistillate flower narrow and spreading: stamens about 15: styles bifid, slender: capsule finely pubescent, subglobose: seed smooth, glabrous, nearly 3 lines long. — Northwestern Sonora, in a low range of hills about thirty miles from the coast; C. G. Pringle, 1884. Allied to *C. Cortesianus*, Kunth.

SEBASTIANIA (?) BILOCULARIS. A monœcious shrub, with light gray bark, glabrous: leaves alternate, linear-oblong or narrowly lanceolate, 1 or 2 inches long, obtuse or acute or acuminate, abruptly contracted at base into a very short petiole, obscurely glandular-toothed, often biglandular at base: inflorescence terminal, the staminate spikes (9 to 12 lines long) bearing a single pistillate flower at base: staminate flowers 4 or 5 together in the naked scattered bracts, the thin calyx 3-parted; stamens 2: ovary 2-celled, with two stout exserted revolute stigmas; capsule smooth, thin-crustaceous, broadly ovate, acute, bicocccous, about 5 lines long, the 2-valved cocci separating from a thin flat 2-nerved imperfect columella: seed subglobose, estrophiolate, 3 lines broad. — In dry water-courses on the hills and mountains of Northwestern Sonora; on hills between Rayon and Ures, Dr. G. Thurber, 1853 (*Sapium salicifolium*, Torr., Bot. Mex. Bound. 201, not HBK.); C. G. Pringle, 1884. Described as 10 to 20 feet high, with upright slender branches; called "Yerba de fleche" by the Papago Indians, who say that the Apaches used to poison their arrows with its milky juice. Aside from the bilocular ovary, the estrophiolate seed, and the peculiar columella, its characters accord with those of the genus as defined by Bentham & Hooker.

HECHTIA TEXENSIS. Diœcious: leaves 18 inches long or less,  $1\frac{1}{2}$  to 2 inches broad at base, white-scurfy beneath, glabrous above, with 10 to 12 large distant variously curved teeth on each margin: fertile flowering stem 2 to 4 feet high, bearing a simple pubescent panicle 2 feet long, the branches ascending: flowers solitary and sessile along the branches, subtended by a broadly deltoid-ovate scarious brownish bract: sepals broadly ovate, acute, 2 lines long, brownish and nerved; petals white, 4 lines long, oblong-obovate, nerved: stamens none: ovary and stigmas pubescent: capsule glabrate, 5 lines long: staminate inflorescence unknown. — On limestone bluffs in the Great Bend of the Rio Grande, W. Texas; Dr. V. Havard, August, 1883. The species of

this hitherto only Mexican genus are not very well known, but judging from the figures and descriptions that are given of them this is clearly distinct, as it certainly is from the San Luis Potosi specimens of Schaffner and of Parry & Palmer, referred perhaps erroneously to *H. glomerata*, Zucc.

**TIGRIDIA DUGESII.** Culm about 10 inches high, shorter than the leaves, from an edible reddish-black bulb: flowers golden yellow, the divisions dotted near the base with reddish purple; sepals oblong-ovate, nearly an inch long; petals hastate-lanceolate, acuminate, half as long, very shortly unguiculate: staminal column stout: filiform segments of the 2-cleft stigmas as long as the anthers (2 lines long): fruit oblong, 4 lines long. — Described from careful drawings and notes received from Professor A. Dugés of Guanajuato, Mexico, where it is known as “Jahuique de Tupátaro.”

**IRIS BRACTEATA.** Rootstock slender: radical leaves solitary, rigid, much exceeding the stem (1 to 2 feet long), striate, one side green, the other glaucous, revolute on drying: stem nearly a foot high, covered with imbricated sheathing bracts 2 to 4 inches long: bracts of the spathe approximate, 2 or 3 inches long, 2-flowered: perianth yellow, with a short funnelform tube; sepals oblong, naked, 2 or 3 inches long, the oblanceolate petals somewhat shorter: capsules on exserted pedicels, ovate-oblong, an inch long. — Collected near Waldo, Josephine County, Oregon, by Thomas Howell, June, 1884. A remarkable species in its foliage. The leaf is unique in character, strictly though obscurely equitant at base, the blade vertical, but the two sides very different, — one side having numerous stomata and an exceedingly thin cuticle, very much as in some revolute-leaved grasses.

**GELASINE TEXANA**, Herbert? (*Calydorea Texana*, Baker.) Stem 6 or 8 inches high, with one or two very narrow scarious-sheathing leaves, the terminal bibracteate spathe  $1\frac{1}{2}$  inches long; pedicel solitary, shortly exserted: ovary narrowly oblong, 3 lines long, narrower below: perianth purple, the outer segments oblanceolate, an inch long, the inner obovate, 3 lines long, about equalling the filaments, which are united nearly to the top; anthers 4 lines long: style equalling the staminal tube, the linear stigmas as long. — In damp prairies at San Antonio, Texas; Dr. V. Havard, April, 1884. This is probably the plant upon which Herbert founded his species, which is known only from his description and from Drummond's specimens (n. 415 of his third collection) upon which it was based. These specimens in the Gray herbarium, however, belong wholly to *Nemastylis geminiflora*, Nutt., with the exception of a single separate imperfect flower. The charac-

ters of this are very obscure, though the filaments (said by Herbert to be free) are evidently coherent, as they are in the present plant. It is pretty evident that Herbert's specimens were in the same way a mixture, and that his characters for the species were largely drawn from the *Nemastylis*. The present species is a true *Gelasine*, and not a *Calydorea*, to which genus Herbert's species is referred by Baker, and by Bentham & Hooker.

**BLOOMERIA CLEVELANDI.** Differing from *B. aurea* in the several very narrow leaves (a line wide or less), in the stouter scape (3 to 7 inches high), in having the thick and fleshy appendage at the base of the filament smooth instead of papillose, and obtuse at the summit instead of bicuspidate, and in the much shorter style, which is shorter than the ovary. — On the mesas near San Diego, California; first collected by D. Cleveland in 1874, and recently received from him and from C. R. Orcutt. *B. aurea* is usually taller and stouter, and with a single much broader leaf (3 to 8 lines wide).

**BRODIAEA (SEUBERTIA) LEMMONÆ.** Near *B. crocea*, the somewhat scabrous scape a foot high: pedicels less than an inch long: perianth deep orange, 4 to 5 lines long, the segments twice longer than the turbinate tube: filaments in one row at the mouth of the tube, rather stout, terete, nearly equal; anthers 1 to 1½ lines long: ovary very shortly stipitate, beaked, the cells 3–4-ovuled. — Collected on Oak Creek, near Flagstaff, Arizona, by Mr. and Mrs. J. G. Lemmon, August, 1884.

**CAMASSIA ESCULENTA**, Lindl. Flowers irregular, the outer or lower segment deflexed, the rest with the stamens and style ascending; segments 3- (sometimes 5-) nerved, narrowed and channelled at base, not connivent after opening, but persistent about the base of the capsule: capsule ovate to oblong, obtuse (6 to 9 lines long), equaling or exceeding the usually short pedicel, transversely veined: seeds shining, oblong-obovate. — Ranging from British Columbia to Northern California and eastward to Western Montana and the Wahsatch, often very abundant.

**CAMASSIA LEICHTLINII.** (*Ornithogalum Leichtlinii*, Baker. *C. esculenta*, var. *Leichtlinii*, Baker, Bot. Mag. t. 6287.) Flowers very nearly regular, the stamens and style ascending, the segments broader and flattened at base, usually 5–7-nerved, connivent and somewhat twisted after opening and at length deciduous: capsule oblong-obovate, slightly emarginate at the apex, usually 8 to 10 lines long and shorter than the pedicels, obliquely veined: seeds obovate, dull. — In Klickitat County, Washington Territory (Suksdorf); at the base of Mount Hood, Ore-

gon (Howell) ; in the Sierra Nevada, Yosemite Valley, etc. (Bridges, Torrey, Gray), and at Punta de los Reyes, Marin County, California (Bigelow). Mr. Suksdorf, as well as the Messrs. Howell, called attention in 1880 to the distinct characters of this species, and the more recent full and careful notes and abundant specimens of Mr. Suksdorf, upon which the above descriptions are based, confirm their opinion. The plant described and figured by Mr. Baker, as cited, appears to be essentially the same. White flowers are not very unusual in *C. esculenta*, and may be expected in this species also, as he represents them. Mr. Suksdorf notes respecting it that the flowers are usually larger and deeper colored than in *C. esculenta*, the stem stouter but less tall, the leaves mostly broader, often flat and spreading, and glaucous above.

**HASTINGSIA BRACTEOSA.** Bulb an inch in diameter: leaves elongated, 1 to  $1\frac{1}{2}$  feet long or more by 1 to 3 lines wide: scape about two feet high; bracts of the very sparingly branched panicle filiform-attenuate, nearly equalling the flowers, which are 4 lines long on very short pedicels: petals white, linear-lanceolate, twice longer than the stamens; filaments inserted above their base: style stout, nearly as long as the ovary and equalling the stamens. — On “Eigh Dollar Mountain,” Curry County, Oregon, by Thomas Howell, May, 1884, with *Darlingtonia* and *Cypripedium Californicum*. This second species confirms in every way the distinctive characters of the genus, and is distinguished from *H. alba* especially by its comparatively longer leaves, more conspicuous bracts, twice larger flowers, and shorter stamens. *H. alba* was also collected by Mr. Howell on hillsides near Kerbyville, Oregon, with mature fruit, which is broadly ovate, nearly 3 lines long, very shortly stipitate, the oblong seeds 2 lines long, with black shining testa.

**LILIUM BOLANDERI.** Bulb ovate, of numerous lanceolate scales 1 to  $1\frac{1}{2}$  inches long: stems  $\frac{1}{2}$  to 3 feet high, 1-2-flowered: leaves mostly verticillate and approximate, oblanceolate, acute, glaucous beneath, 1 to  $2\frac{1}{2}$  inches long: flowers horizontal or somewhat nodding, “dingy purple” (Rattan) or “dark brownish red” (Howell), becoming somewhat paler, spotted, the segments  $1\frac{1}{4}$  to  $1\frac{3}{4}$  inches long, but slightly spreading, rarely at all recurved: anthers 2 or 3 lines long, the ovary and style 9 or 10 lines long. — In the Red Hills, Humboldt County, California, by Bolander (n. 6558, in part) in 1867; near Arcata, on Humboldt Bay, California, by Volney Rattan in 1878, and on the summit between Illinois and Smith Rivers, near the State boundary, in 1879; and in the same region by Thomas Howell, June, 1884. A well-marked species, allied to *L. parvum* and *L. maritimum*.

**TRILLIUM RIVALE.** Stems slender, 2 to 8 inches high: leaves lanceolate, rounded or subcordate at base, acute or acuminate, 1 or 2 inches long, on petioles 1 to 15 lines long: pedicel slender, suberect or at length declinate, a little shorter than the leaves: petals subrhombic, acute or acuminate, 6 to 12 lines long, white or more or less marked with purple: stamens exceeding the short stigmas, the filaments adnate to the ovary at base, about equalling the anthers: ovary attenuate above; capsule globose, slightly if at all angled, nearly a half-inch in diameter, beaked by the short style. — On stream-banks in the Siskiyou Mountains, California, and Coast Ranges of Southwestern Oregon. Collected in 1880 by W. H. Shockley at Big Flat, thirty miles east of Crescent City, and by Thomas Howell in June, 1884. It is allied to the eastern *T. nivale*, which it much resembles in habit.

**PICEA BREWERIANA.** Branches slender, often elongated and pendent, puberulent: leaves 5 to 12 lines long,  $\frac{1}{2}$  to nearly one line wide, strictly sessile upon the slender base, obtuse, smooth and rounded or slightly carinate above, stomatose beneath on each side of the slightly prominent midnerve: cones 3 inches long, narrowly cylindrical, attenuate at base; bracts linear-oblong (2 lines long), a fourth of the length of the puberulent scale, which is obovate with the rounded thickish summit entire: seed  $1\frac{1}{2}$  lines long, the wing 4 lines long by  $2\frac{1}{2}$  broad. — This unusually distinct species has been found (by Thomas Howell, in June, 1884) only at high elevations in the Siskiyou Mountains, California, on the head-waters of the Illinois River, in rather dry rocky ground. It grows to a height of from 100 to 150 feet, and a diameter of 1 to 3 feet. Bark reddish. The specific name is given in compliment to Prof. W. H. Brewer, who in connection with the California State Geological Survey had so much to do with the botany of the State, both in the field and in the after disposal of the collections of the Survey. As he took especial interest in the trees of the coast, and collected a large amount of material for their study, it is fitting thus to connect his name with the forest trees of California.